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No. 951

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PLANNING AND PLAN IMPLEMENTATION

BUNICH DISCUSSES PLAN FULFILLMENT, INCENTIVES

Moscow SOVETSKAYA ROSSIYA in Russian 30 Nov 80 p 2

[Article by P. Bunich, Associate Member of the USSR Academy of Sciences, Chairman of the Committee on Management Problems of the USSR Council of Scientific-Technical Societies: "Energizing the Plan: The Science of Managing"]

[Text] It was noted at the October Plenum of the CPSU Central Committee that tasks laid down by the Party related to perfecting the administration and planning mechanism and improving management methods have still not been completely accomplished. Experts, including scholars and scientists, are working on these unresolved problems. What they have suggested and devised is the subject of widespread discussion during this pre-congress period. P. G. Bunich, Associate Member of the USSR Academy of Sciences, shares his thoughts today on providing incentives for vigorous plans, on mechanisms for increasing the motivation of enterprise collectives to enhance production efficiency.

I would like first of all to present the reader with some "puzzling" situations.

Enterprises of the Ministry of Chemical Industry increased their realized production output last year by only one per cent. In the former Ministry of Pulp and Paper Industry, growth was five times greater. But if we use another index in evaluating their industrial activity, percentages of plan fulfillment (and both remuneration for labor and--as it is said--the honor and glory depend primarily on this), then it turns out that there is no essential difference--it is as if their work were identical.

Or consider this. Labor productivity in the Ministry of Instrument Making increased twice as quickly over the past three years as in the Ministry of Construction, Road, and Municipal Machine Building. Was this difference reflected in compensation? Absolutely not. The relative increases in wages were more or less the same.

Even with all the outward "disparity" in these situations, it is not difficult to note that in each case one and the same thing applies: growth in labor productivity, increasing production output on the same equipment and in the same areas, economizing on labor and material expenditures and other indices, the sum total of which determines production efficiency, have little or no effect in evaluating the work of the collectives.

Why is this so? What is going on here? The answer lies in the mechanism for providing production incentives.

In evaluating enterprise activity today we have the principle of fulfilling the plan. Right? It would be ridiculous to object to this. Ideally, moreover, under normal conditions this principle must be the fundamental one in determining work results. Yet there is a substantive contradiction that has arisen in the system of providing incentives and in practical management. There are inducements for plan fulfillment and over-fulfillment regardless of how vigorous the plan is, i.e., regardless of economic efficiency.

There was some discussion at the 25th party congress to the effect that the volume of economic incentive funds in each enterprise, conglomerate and department should be allotted depending on production intensification, labor productivity, production quality improvement and technological progress. A great deal is being done in this regard, but the managerial mechanism of today is a long way from always "working" to these ends; at times it even acts to the contrary...

I will offer another example to illustrate my concept. An examination of work in institutions of the Ministry of Machine Tool and Tool Building industry was conducted last year. It was found that the plans it originally drew up were later reduced tenfold! And this permitted a distribution of 4.5 million rubles in bonuses alone, not to mention other state expenditures on material incentives.

I do not at all mean to say by this that the directors and employees of machine tool industry enterprises are such awful "good-for-nothings" that they are only thinking about how they can understate plans and receive illegal bonuses. No, it's not so much the people we're talking about.

We often criticize plant managers and institution directors for failing to exhaust all internal reserves in preparing the initial data for plan development and subsequent plan approval. We accuse them of setting aside material-technical and labor resources "as a safety margin." And we are correct in criticizing this. If we are talking about a manager's character, his social and moral orientation, then it would be putting it mildly to say that such practices don't shed a favorable light on the industry executive. Conversely, endeavoring to lay all reserves at the disposal of the job speaks for one's citizenlike, political maturity. But is all right if the industry executive's social and moral orientation is supplemented as well in all instances by the objective situation he finds himself in, or as people say, "the world in which he revolves." What I mean is the set of normative documents and the methods of providing incentives that affect him, his views, his points of reference, and finally, his psychology. One must agree that, if, from a work remuneration point of view it is more profitable for both the manager and the entire collective to be fulfilling a plan which is less vigorous rather than more so, then you will find directors (and they do exist) who will do a lot of talking about intensification and increasing efficiency, but in fact they find the thought of an easy program enticing.

The advantages of our system of management lie in centralized planning, and in its incorporation with initiative from below, with the scrutiny and creativity of the masses. Counterplans have appeared in due course in production management as one of the manifestations of this democratic principle. It is the enthusiasm of the working

class that gives rise to these plans--their striving to expand their contribution to the common interest. But it goes without saying that additional plans should in no way reduce the role or the scope of the basic plans. It is precisely the effective coupling of the two that should be supported by the incentive system. But the key factors of this system have not been sufficiently thought out; they frequently play quite a different role. I won't go into all the details; I'll simply offer one or two specifics to illustrate. If the basic plans go unfulfilled, then the incentive funds are formed based on lowered standards; if it's the supplementary plans that are not fulfilled, standards are not reduced. In addition, bonuses for directors and engineer/technical employees and workers (on whom formulation of the industrial program depends to a great extent) are lower for each percentage point fulfillment of the basic plan that of the supplementary one. The incentive for the former is on the whole 12 times lower than for the latter. One need not be an economist to see that lowering the indices for the basic task under such conditions (and this is the lion's share of the production) is more beneficial than raising them.

There are yet several other provisions and instructions that regulate economic activity that are moving in this far-from-optimal direction. These often encourage enterprise managers to overestimate resource expenditures in the plan, since what counts is, once again, not how efficiently they are used but how they correlate with the plan.

I want to make special mention of the consequences that result when the number of workers is overestimated, i.e., when we have wasteful utilization of our most prized resource--labor. We will first cite a fact that was mentioned in an article from "Sovetskaya Rossiya" (Mtsensk edition," 2 Oct 1980): The plant made side-expenditures (on agricultural projects and others not related to the production program) of over 300 thousand man-days. I don't know what production output norms were stipulated in the numerical planning base, nor will I go into other details, but the conclusion is quite clear: Opportunities to "insert" an overexpenditure of labor resources into the plan did exist...

We are talking about the sphere of management, about what the understating of plans, the overestimating of resource expenditures, etc.,--I could go on--are fraught with. But we are hardly entering the unknown in talking only about deficiencies in the existing system of providing material incentives. Stated one way or another, these issues are being discussed by economists, by enterprise directors and department managers, and in the press. Decisions of the CPSU Central Committee and the USSR Council of Ministers on improving planning and the mechanism of management point to the necessity of providing incentives to implement vigorous plans. The problem is beyond that of completing the tasks they've assigned.

It is our view that an evaluation of the activity and incentives provided by collectives for an achieved level of effectiveness, for a real contribution to the national economy, for the work's final result, can become an effective method of providing incentive (and, naturally, plan fulfillment and over-fullment) for implementing vigorous plans.

I must state right away that all of the issues that are cropping up here are related to the most complex issues in economics. It goes without saying that the basis for the evaluation of enterprise work will include such indices as production expansion,

not of the notorious "gross output" but of the kinds of production the country needs, technological progress; growth in productive labor; conservation of resources; and, in a wider sense the difference between results and material expenditures, which, in the final analysis, will be reflected in a pure profit index. It will become an index of efficiency and a source of remuneration, of encouragement for the collective and for each individual worker.

In all likelihood no one would begin to argue against--let us call it the "standards" method. But the transition to it requires that many rather complicated problems be resolved.

Let us put it this way. Enterprises differ from one another by virtue of their size, production mode (individual, serial, or mass production), their technological level, geographic location, natural resources, variance in the cost of raw materials, etc., etc. Correction factors can be applied in these cases so that external factors and circumstances that do not depend on the collective have no effect, so that the evaluation of activity efficiency corresponds objectively to its labor achievements.

Specific questions as to making a good showing with respect to certain indices a prerequisite for putting a proposed incentive system into effect, questions on incentive norms--raising or lowering them temporarily to suit one enterprise or another, merit separate analysis and discussion. There is no need to delve into them here, since this is already being done by experts.

As far as difficulties are concerned, I want to make one observation. Our socialist economy is an exceedingly diversified, and at the same time, indivisible entity. This is where its strength lies, its power; but it is also where we find difficulties in managing it--difficulties that are growing, on the one hand, in the light of centralized planning and management, and on the other, in view of its democratic nature that opens up a vista for exercising initiative and independent action. To find and develop a system of incentives which, being located as it were in their midst, and absorbing both of these management advantages, would facilitate their merging interaction, a far from simple task, to be sure. But it is here that complexity is precisely what is needed, and not simplicity.

The simplest way is not always the best way. Is it possible that the existing system is best--a system which effectively removes difficulties for planning body workers as well as the department management staff, the production management apparatus? All of the factors today are considered, in essence, "beyond our control"; accordingly, incentive funds are distributed outwardly by the "fairest" method--by equalizing... It's as if everybody's okay, no one gets hurt, but in actuality, it's fine for those who work poorly and discouraging for the good workers.

Thus, the paradox of the current situation with regard to economic production incentives is this: Two of the most important economic parameters--plan and efficiency--seem to have turned out diametrically opposed. Yet they should be synonymous. The thrust of the proposal I am discussing is to achieve just such a condition.

Incidentally, we are already ovserving elements of the "standards" method, and attempts to move in that direction. In some instances this is embodied in normative actions, i.e., comes from above; in other cases it winds its way through as initiative from below. Up to 15 percent of temporary increases in wholesale and retail

prices for high-quality consumer goods are currently apportioned to material incentive funds for workers who have participated directly in manufacturing improved-quality goods. Increases have also been introduced in response to the increased efficiency of new technology. It is envisaged that widespread usage of this type of incentive to achieve efficiency and quality will extend to all goods of technical and vocational designation. In this instance it is the key factor of prices that is having an influence on increasing production efficiency and prices are established on the centralized scheme.

Here is a trend that is coming from below--the Shchekino experiment. Chemists in Shchekino tried out the material incentive method for increasing production with minimal labor resource losses and achieved astonishing results. In ten years, production output increased more than threefold; labor productivity experienced a more than fourfold growth; profits went up by a factor of almost two-and-a-half; and the number of production personnel was reduced by 1800--almost one-fourth of the collective.

This sometimes raises the question--if the "Shchekino" **way** yields such excellent results, why is this method, already in its second decade and approved by the CPSU Central Committee, being introduced "begrudgingly" in many enterprises, conglomerates and departments and in other cases people are even renouncing it. The thing that prevents universal adoption of the progressive system of incentives, the way I see it, is that these incentives are infrequently "entered" into the mechanism and principle providing incentive for "over-plan." In other words, things are being hampered by the very same contradiction with which I began this article.

Our task, then, is to evaluate the activities of the collectives (from brigade level up to branch of industry) proceeding from the factual, ultimate results and the total amount of pure profit with common department standards for allocating incentive funds from such profit. This will foster greater interest in vigorous plans and in conservation of all our resources and in the dynamic factors of growth.

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IMPACT OF MONETARY TURNOVER ON PRODUCTION EXAMINED

Moscow DEN'GI I KREDIT in Russian No 11, Nov 80 pp 16-20

[Article by Professor I. I. Konnik: "The Circulation of Money and the Efficiency of Social Production"]

[Text] It is well known that the character of production and also of the process of reproduction is determined by the way in which manpower is combined with the means of production. The latter governs not only the socioeconomic nature of the process of reproduction, but also its type--extensive or intensive. Moreover, the way in which the personal and physical factors of social production are combined takes on various aspects of its own. As an expression of property relations this method governs the socioeconomic nature of the process of reproduction and the goal toward which it is oriented, which in turn is crucial to the particular proportions that take place among the sectors of the economy and the spheres of reproduction, to the composition of the gross social product, and to the distribution, redistribution and use of the national income. Here flows of money, whose sources are the resources of the budget, the credit system and associations (enterprises) themselves, not only support formation of the proportions established in plans, but also have a vigorous impact on the balance between the physical content and value form of the process of reproduction, and consequently also tends to raise the level of its organization according to plan.

The actual social combination of manpower with the means of production when commodity-money relations are retained in the stage of socialism is distinguished by the peculiarity that in the primary units of the national economy this combination takes place on the basis of the principle of personal material motivation, which is related to the economic interests of associations (enterprises) and of society as a whole. Thus combination of manpower with the means of production is mediated by the circulation of money involved in the payment of wages and bonuses from material incentive funds, which is the principal channel whereby cash enters into circulation. Ignoring that the circulation of money is necessarily involved in the actual social combination of the personal and physical factors of production under socialism and that this process is based on the principle of material

motivation would conceal essential differences between socialism and full communism which were stressed by the founders of scientific communism.

The real possibility for the circulation of money to have an impact on the entire process of reproduction lies above all in this difference. Of course the directly social character of the combination of the personal and physical factors of production under socialism is not eliminated by the fact that it is mediated by the circulation of money. But this circulation of money in the form of various wage systems has a comprehensive effect on the process of reproduction--the rise of labor productivity, changes in the level and composition of personal money income, the quality of products produced, the use of productive capital, distribution of the national income into the accumulation fund and consumption fund, and so on.

The second aspect of the way in which the personal and physical factors of production are combined, which does not directly express property relations, but determines the type of reproduction--extensive or intensive--is related thereto. Once again the circulation of money plays an important role in this determination.

In the intensive type of reproduction, which is based on accelerated scientific-technical production, the personal factor of production takes the form of highly skilled manpower capable of ensuring a high level of labor productivity, the most intensive use of productive capital, reduction of the materials intensiveness of products and a rise of product quality. When the cultural and technical level of manpower is at that high level, the circulation of money expands considerably, the reason being the constant rise in the wages of workers and employees and the money income of kolkhoz members. But the main thing here is that the circulation of cash is organized in forms that ensure material stimulation of a rise of labor productivity, reduction of production costs, improvement of the quality of the products produced, i.e., the principal factors in the intensive type of reproduction. This is achieved through broad use of bonuses from the material incentive fund in raising wages, through the work-team form of organization and work incentives, as envisaged by the decree of the CPSU Central Committee and USSR Council of Ministers dated 12 July 1979, by registering in the bonus system the rise of labor productivity by virtue of intensive factors, the rise in product quality, reduction of production costs, cost savings, and so on. Here the circulation of money resulting from remuneration is oriented toward material stimulation of qualitative indicators of the performance of associations (enterprises) and thereby toward intensification of the process of reproduction, toward its higher efficiency. In other words, by mediating the combination of manpower with the means of production the circulation of money tends to intensify social production by supporting the formation and movement of the wage, which is used as an economic lever for stimulating a rise in the efficiency of the process of reproduction. It is necessary for the circulation of money to mediate the way in which manpower is combined with the means of production under socialism because of the level of development achieved in directly social

labor, and the related objective need for deliberate use of the circulation of money to exert an impact on all phases of the process of reproduction comes about because of the planned character of the process of socialist production and reproduction and the need for conscious use of the system of economic laws of socialism in their planned management.

Since commodity-money relations have been preserved, the forms of manifestation of the economic laws of socialism are mediated by the circulation of money. In this situation the deliberate use of these forms of manifestation of the economic laws in order to stimulate a rise in the efficiency of social production depends to no small degree on the state and structure of the circulation of money as well as on those functions which are performed by the money that takes part in this circulation. For example, as the form in which the basic economic law of socialism and the law of distribution according to labor is manifested, the wage is served by two flows of money in the process of its formation: one which forms the fixed part of the wage, which is guaranteed by the state in accordance with the wage-rate system, and the other which forms the variable portion of the wage, whose source is the resources of the material incentive fund. The proper relationship between these two flows of money has great importance in strengthening the role of the wage as an incentive.

Excessive growth of the flow of money that serves the formation of the wage from the material incentive fund tends to weaken the wage-rate system and encourages the emergence of elements of leveling in distribution according to work. Moreover, this situation can cause an imbalance between effective demand and the supply of commodities, which will also have an adverse effect on the role of the wage as an incentive.

Conversely, if the flow of money used to increase the wage from the material incentive fund is excessively restricted, opportunities are thereby diminished for using the wage as an economic lever for raising the efficiency of social production. It is obvious that the role of money in the cost-accounting activity of enterprises and in realizing the economic laws of socialism is also substantially diminished here.

However, use of the circulation of money also involves planned formation of value (money) proportions in the process of expanded reproduction, which have a large role to play in ensuring the efficiency of social production. For example, the flow of money performs a dual role in the planned formation of proportions between the two departments of social production and between the phases of reproduction.

First, expression of the value of the means of production and consumer goods in money as a measure of value in the process of planned pricing has essential importance to correct determination of proportions between the two departments of social production. Proportions between the two departments will take shape as a function of the level of prices of means of production and consumer goods, of the degree of their approximation to value,

and consequently, of their reflection of the socially necessary production costs. Consequently, the process of planned pricing and of the measurement of the value of the means of production and consumer goods in money has no small importance in optimizing national economic proportions. But it also plays a definite role in establishing the volume of the circulation of money, which in turn has a feedback effect on the level of planned prices.

Second, the circulation of money also influences the process of the planned formation of proportions between the two departments of social production in the sense that it is an important element for balancing the physical content and value form of the process of reproduction. If proper correspondence between the growth of the circulation of money and the growth of the volume of production of consumer goods and retail sales is not achieved for one reason or another (nonfulfillment of assignments for the rise of labor productivity, a lag in activating capital construction projects, and so on), it is obvious that the interests of balanced development of the national economy, material stimulation of the rise of labor productivity and raising production efficiency require that the growth rates of Department II be speeded up and brought closer to the rates of growth of the production of Department I.

Stable circulation of money and stable (or rising) buying power of money are a mandatory prerequisite for balance between the physical content and value form of the process of reproduction and help to raise the efficiency of that process. It is well known that scientific-technical progress, constant application of new technology to production, and improvement of the technology of production processes are the principal condition for the steady rapid rise of labor productivity. But correct determination of the efficiency of new technology and, consequently, the possibility of its application to production depend on the amount of value represented in each monetary unit. When the purchasing power of the money is high, each monetary unit expresses a large value as a representative of the monetary commodity--gold. In this case the monetary expression of the value of goods (means of production) turns out to be correspondingly lower, that is, prices are being set in conformity with plans at a depressed level.

Obviously, when prices are low and the purchasing power of the money is high, tending to reduce the outlays of associations (enterprises) to acquire new technology, the limits of its application expand, since the saving from its application considerably exceeds the outlays of associations and enterprises to purchase the new and improved equipment. Here the associations (enterprises) which are the producers also gain, because low prices of means of production reflect a rise of labor productivity in their production and consequently a reduction of their cost.

A different situation takes shape when prices of means of production rise. In this case the growing costs of associations (enterprises) to purchase new technology restrict the limits of its application, since the saving from application of the new equipment must exceed the higher outlays to

purchase it. If the higher prices of new technology reflect its higher useful benefit and the latter increases faster than prices are rising, then in this case the limits on application of the new technology will not be narrowed. But the purchasing power of the money may drop in this case if the rise of prices of the means of production exceeds the size of the useful benefit attained, which has an effect on the efficiency of application of new technology and correspondingly on the rise of labor productivity in the national economy.

The state of the circulation of money and its stability also tend to increase the output-capital ratio, which is the most important factor in the rise of the efficiency of social production. Since the output-capital ratio is the ratio of the gross social product to the value of fixed capital, it is obvious that an unjustified rise of prices of means of production used as fixed productive capital will restrain the rise of the output-capital ratio, since the value of the product produced will in this case be divided by a higher price of fixed productive capital.

At the same time there may be an artificial growth of output at the enterprise producing the implements of labor (used as fixed productive capital) and a correspondingly unjustified rise in the output-capital ratio, which will weaken incentives for raising it authentically and for saving on material costs in production.

The reverse phenomenon may be caused by unjustified depression of prices of the instruments of labor, when the associations (enterprises) using the new technology lose interest in increasing the output-capital ratio, since at the low monetary expression of the value of their fixed productive capital these economic entities will have a high output-capital ratio without particular effort even if the rise in the volume of output is negligible. As for associations (enterprises) producing new technology, a depression of the prices of the implements of labor may weaken their material motivation to produce these products and may result in a drop in the output-capital ratio.

Depression of the wholesale prices of raw materials and supplies may adversely affect the rise of production efficiency to an equal degree. In this case the profitability of associations (enterprises) in the extractive industry (with their typical tendency toward a rise in production costs)* will in this case drop, stimulation of the growth of production will be weakened for those industries whose development determines technical progress to a considerable extent.

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* In the 8 years which have passed since revision of wholesale prices in 1967, the production cost of natural gas has doubled, that of petroleum has risen 41 percent, and that of iron ore and manganese ore (on the basis of metal content) has risen 24 percent and 22 percent, respectively (PLANOVOYE KHOZYAYSTVO, No 1, 1978, p 69).

The depressed prices will in turn hold back the process of reducing the materials intensiveness of products in industries using raw materials and supplies (produced by the extractive industry), since when prices of raw materials and supplies are low it is "more advantageous" for associations (enterprises) to have higher materials intensiveness of their products (to pay more for the additional purchase of raw materials and supplies) than to spend money to carry out measures to reduce the materials intensiveness of their product.

It is therefore obvious that increasing the purchasing power of money has a constructive effect on the rise of the efficiency of social production only if the price reduction it is based on truly reflects a rise in labor productivity and a reduction of production costs, i.e., has been brought about objectively and quantitatively expresses that objective necessity. Only under this condition does a drop in prices not only not detract from their role as an economic lever for raising the efficiency of social production, but on the contrary enhances that role.

There are two ways in which the circulation of money tends to raise the quality of products produced as a factor in the efficiency of social production.

First, through the system of prices used as a lever for material stimulation of the rise of product quality. It is most effective in this respect to combine a simultaneous rise of wholesale prices for the best products (superior quality) with a partial reduction of prices of obsolete products (low quality) which are not in demand, as envisaged by the decree of the CPSU Central Committee and USSR Council of Ministers dated 12 July 1979. In this case the volume of the circulation of money may not change (when there is mutual compensation of price increases and reductions) or may change negligibly, but the results of its impact (through growth or reduction of the money income of associations and enterprises) toward improvement of product quality and consequently the rise of production efficiency increases immeasurably.

Second, the rise of quality is also encouraged by planned regulation of the money supply and by ensuring its correlation to the volume and composition of stocks of commodities for sale on the market. The reason is that the process of selling goods under socialism ensures, as we know, "exchange of substances" between the departments of social production and the sectors of the economy, and at the same time performs the function of social recognition (additional and final) of the expenditures of labor incurred by associations (enterprises) in production of the particular commodity.

When there is a surplus of money in circulation (in noncash and money transactions), i.e., when there is an imbalance between effective demand and the supply of goods, social recognition (because of the shortage of commodities) may also go to those commodities whose quality does not justify the social labor expended on them. Conversely, when the market is

saturated with various goods, as effective demand rises, higher demands are made concerning the quality of goods which enterprises manufacture, since the supply of goods is beginning to exceed effective demand. Here the relation of production to consumption takes on new features: the latter has a vigorous impact on the former in the direction of a full-fledged rise in its efficiency. But this impact is effected through the circulation of money which takes place with the satisfaction of effective demand both of individuals and also of associations (enterprises).

But here there is another aspect as well. As the market becomes more saturated with various goods of high quality, the movement of money speeds up--it settles in the form of money saving only insofar as this is economically necessary and in accordance with the growth rates of personal money income. Thus most of the money in circulation is serving the circulation of commodities and is helping to intensify the circulation of commodities, since in this case commodities (consumer goods) are not held in the sphere of distribution; they are constantly leaving it for the sphere of consumption and are constantly being replaced by new arrivals of stocks of commodities from associations (enterprises) in Department II. But intensification of the distribution sphere stimulates intensification of the process of production of consumer goods, which in turn, by a chain reaction, provides the motive for intensification of the production process of associations (enterprises) in Department I and above all those of them which are producing means of production for Department II.

We should note that the circulation of money and its stability tend to raise the efficiency of social production and the balance among its elements primarily through the cost-accounting mechanism of the functioning of associations (enterprises). If the cost accounting and profitability of associations (enterprises) and a growth of their accumulation is an indispensable condition for the strength of the circulation of money in socialist society, there is also the reverse relation: stable circulation of money based on stable or rising purchasing power of the money comprises the basis for true cost accounting, for ensuring the growing profitability of associations (enterprises), and for the effective functioning of all economic levers.

Moreover, it is not merely the size of the turnover of money which has decisive importance for intensification of social production under present conditions, but also its correlation to the needs of the developing economy and its correct and purposive promotion of the process of raising the efficiency of social production. This also presupposes a corresponding distribution of money turnover between noncash and cash transactions, and then the proper distribution within each of these spheres in accordance with the purpose for the planned use of the particular instrument.

Strengthening the circulation of money by stabilizing and increasing the purchasing power of the ruble above all strengthens the effect of such an economic instrument as the wage in stimulating a rise in the efficiency of

social production. A rise in the purchasing power of the ruble, i.e., increasing the "commodity burden" for every ruble in circulation, signifies an intensification of the circulation of money and an increase in the rate of turnover of the money, which gives society a certain saving on distribution costs.

At the same time, increasing the real wage enhances its role as an incentive in production--in raising labor productivity, in economizing on material costs, and in improving the quality of the goods produced. The possibility is thereby created for greater linkage between the rise of wages and the final results of the activity of production associations (enterprises), which has great importance to the efficiency of their operation and to the rise of labor productivity, profitability and accumulation.

When the purchasing power of money is stable, associations (enterprises) are motivated to earn greater profit as they achieve a real saving on social labor and reduce production costs. Under such conditions a growth of profit can occur only if the increase of output or reduction of production cost exceeds the drop of prices of the product or the rise in the purchasing power of the money. In other words, the latter encourages high growth rates of labor productivity and a rise in production efficiency in associations (enterprises). And conversely, when the purchasing power of the money drops because of rising prices, associations (enterprises) may obtain unjustifiably high pro t even when there have been no achievements whatsoever in saving on expenditures of labor and in reducing production costs, which tends to detract from the principle of material motivation of associations (enterprises) to increase the efficiency of their operation and to strengthen cost accounting.

It is well known that planned economic development, just like the cost-accounting activity of associations (enterprises), is based on a system of long-term norms covering the production and distribution of the product created. These norms are operative not only in physical form (allowed expenditures of materials, supplies, fuels, and so on), but also in monetary form, which is typical of the synthetic norms (normative distribution of profit, determination of the wage fund, and so on). The decree of the CPSU Central Committee and USSR Council of Ministers dated 12 July 1979 calls for working out stable economic norms for the 5-year period, their broad introduction into the activity of production enterprises, associations and ministries, and the use of long-term norms in the distribution of profit, in the formation of cost-accounting funds and in the planning of wages.

Thus effective performance by the norms of the role intended for them as one of the important tools for guaranteeing proportionality in the national economy and as an incentive for cost economies in production depend to no small degree on the stability of the circulation of money. If the purchasing power of the money is stable or rising, associations (enterprises) are really convinced that a saving on live and embodied labor in production will be reflected in a growth of profit and in their cost-accounting funds.

The same applies to the wage norm, whose real level depends on the level of wholesale prices.

Nor is there any doubt about the influence of the circulation of money and of its condition on the process of planned pricing and on the effectiveness of such a universal economic instrument as the price. But in spite of general recognition of the proposition that under socialism the price is the money expression of the value of a commodity, the problems of planned pricing are still not always studied in their interrelationship with the circulation of money and its influence on the process of pricing.

It is obvious that in the context of a socialist economy it is not the circulation of money that determines the planned prices, but, the other way about, the level of the latter mainly determines the size of the circulation of money at a given volume of turnover of commodity and a given rate of turnover. But the very process of planned pricing cannot but take into account such a substantial factor as the circulation of money, since in the context of a socialist economy the circulation of money, as V. I. Lenin pointed out, verifies the state of balance among all the elements in the process of reproduction, and in that sense plays a vigorous role in reproduction.

Stability of the circulation of money is also an indispensable condition for effective ruble control by the bank over production and sale of commodities by associations (enterprises) and over their overfulfillment of planning targets in this area and consequently assignments as well for the rise of labor productivity and for raising production efficiency. When the purchasing power of money rises, there is also an increase in the material coverage of credits extended by the bank, since in this case more material values are needed in associations (enterprises) to secure credits at one and the same amount of credit. This relative increase in the proportion of material security of credits extended by the bank above all signifies stronger and broader bank control by means of the ruble, and it also requires that associations (enterprises) increase their output and improve their product quality in accordance with the demands for material security of the credits obtained.

Consequently, stability of the circulation of money and a rise in the purchasing power of money have great importance to strengthening the effectiveness of credit and to enhancing its role in reinforcing cost accounting and in stimulating a rise in the efficiency of social production and increased output of products needed by society.

Thus the circulation of money has a comprehensive impact on the process of the intensification of social production and on raising its efficiency. But this impact may be constructive only if there is constant improvement in the credit, settlement and cash operations of all units in the banking system--in the direction of a comprehensive strengthening of the circulation of money and of increasing its stability.

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INVESTMENT, PRICES, BUDGET AND FINANCE

METHODOLOGY FOR DETERMINING EFFECTIVENESS OF CAPITAL INVESTMENTS

Moscow EKONOMICHESKAYA GAZETA in Russian No 2, Jan 81 pp 11-14

[Unattributed official instructions on the procedure for determining the economic effectiveness of capital investments]

[Text] In accord with the Decree of the CPSU Central Committee and the USSR Council of Ministers "On Improving Planning and Strengthening the Effect of the Economic Mechanism on Improving Production Efficiency and Work Quality" of 12 July 1979, No 695, the USSR Gosplan and the USSR Gosstroy have approved the temporary, new Standard Procedure for Determining the Effectiveness of Capital Investments. This has been prepared by the Scientific Council on the Economic Effectiveness of Fixed Capital, Capital Investments and New Equipment of the USSR Academy of Sciences with the participation of the USSR Stroybank.

Upon the numerous requests of our readers, this temporary provision is being published in issues Nos 2 and 3 of our weekly.

I. General Provisions

1. The task of the current Standard Procedure is to establish the methods for calculating and setting the economic effectiveness of capital investments for the purposes of improving planning and strengthening the effect of the economic mechanism on raising the efficiency of social production and work quality, as well as for disclosing reserves for the intensification of production. The designated methods and indicators are to be applied in working out the capital construction plans and in analyzing their fulfillment, in the designing of construction, in working out and setting measures related to the development of the reconstruction and improvement of production at current enterprises, in assessing the effectiveness of expenditures into non-production end projects as well as into conservation measures.

The Standard Procedure is designed for obligatory use by the planning bodies, the ministries, departments, associations and enterprises, and by the scientific research and design organizations in establishing plans and designs.

The calculations of the economic effectiveness of capital investments should be made in all stages of elaborating the five-year and annual economic and social development plans, as well as for the basic directions of economic and social development for 10-15 years and the longer run. They should be carried out in working out the comprehensive programs for scientific and technical progress, the specific

comprehensive scientific and technical programs, and individual technical and economic problems relating to the development and placement of the national economic sectors. On the basis of the Standard Procedure, the ministries and departments, with the approval of the USSR Gosplan, are to work out the sectorial instructions which consider the particular features of the calculations of capital investment effectiveness in the national sectors and subsectors, as well as instructions to set capital investment effectiveness in locating production, in building projects in sectors of the nonproduction sphere, in assessing environmental conservation measures, and in solving other national economic problems.

2. In the calculations of the economic effectiveness of capital investments and in setting the advisability of making them, a national economic approach is essential. A capital investment project can be included in the state plan if it is shown that it is effective not only within the given sector and subsector, but is also capable of increasing the efficiency of the entire national economy. In this regard, capital investment effectivness should be defined both in that national economic unit within which the investments are to be made, as well as in the adjacent (related) production sectors and for the consumers.

3. The determining of capital investment effectiveness in planning is aimed at the selection and economic setting of the most effective capital investment areas, that is, the best variation for the development of the national economic complexes, the national economic sectors, the sectors and subsectors of industry, agriculture and transportation, as well as the individual republics and regions, considering the solution to socioeconomic problems within the given planning period and over the long run, determining the influence of the chosen capital investment variation on the effectiveness of social production, as well as an assessment of the results of carrying out capital construction plans.

4. Determining capital investment effectiveness in designing is aimed, in addition to what has been indicated in Point 3, at the selection and economic setting of the best versions for the construction of new enterprises and installations, the expansion and reconstruction of existing ones, their complexes, new production processes, equipment, machines, materials and other types of equipment which provide technical progress in the national economy, and in addition, the calculation of the effectiveness of the versions to be applied for consideration in compiling capital construction plans and in assessing their fulfillment.

5. In determining the economic effectiveness of capital investments related to carrying out the long-range tasks of national economic development, to the introduction of major scientific discoveries and inventions and new types of equipment, to the putting of new major amounts of natural resources into production, and to the development of new economic regions and complexes, the assessment and setting of the economic effectiveness of capital investments should be carried out considering the prospects for the full completion of the construction programs, changes in equipment, in the location of raw material sources, production and consumption areas, considering possible changes in prices and the effectiveness norms.

6. Capital investment effectiveness is determined by comparing the effect from making the investments with the amount of the investments. The increase in national income caused by the investments is the overall national economic effect of the capital investments. Correspondingly for the sectors and subsectors of the national

economy, the effect is the increase in net product, and for the ministries, departments, associations and enterprises, the increase in net product (normed).[1]

The criterion for national economic effectiveness of capital investments for the nation as a whole is the ratio of the increase in national income (in comparable prices) to the capital investments which caused this increase, and on the other levels of management, the ratio of the increase in net product or normed net product to this same amount.

On the cost accounting level of management and particularly in utilizing internal funds or bank credit for construction, the increase in profit is viewed as the effect from the capital investments. Correspondingly, the cost accounting effectiveness is assessed by its ratio to the amount of capital investments.

7. In planning and designing, the overall (absolute) economic effectiveness is determined as the ratio of the effect to the capital investments into the given measure, and to the comparative effectiveness as the ratio of the savings of current expenditures to the inverse difference of capital investments according to the different versions.

In determining absolute effectiveness, one examines the overall amount of the effect (the increase in national income, net product or net product (normed)), and on the cost accounting level of management, the increase of profit and its ratio to the capital investments into fixed and working capital or into raising the technical level of capital. In determining the comparative effectiveness, one examines the ratio between the difference of current expenditures and the difference of the capital investments according to the different versions. The calculations of the overall and comparative capital investment effectiveness complement one another.

8. In the volumes of capital investments used for calculating effectiveness, consideration is given to the expenditures for all financing sources for the creation of new productive and nonproductive fixed capital as well as for the reconstruction and expansion of existing fixed capital. The capital investments include expenditures on construction-installation work, the purchasing of equipment, means of transport and supplies, as well as on design and research work and other types of preparatory jobs related to the construction, the results of which may not be embodied in fixed capital (for example, expenditures on the special training of operational personnel for the enterprises being developed, and so forth).

The expenditures on the formation (supplementing) of working capital must also be added to the capital investments into fixed productive capital, or the reduction in the amount of working capital considered.

9. In determining capital investment effectiveness, consideration is given to the related capital investments for those expenditure elements for which there is a

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[1]Since a portion of the effect can be caused by measures not related to the capital investments (for example, organizational ones) or by a change in prices, this if possible should be considered in the calculations.

significant increase of investments into the related sectors (in the absence of major capacity reserves here)[2] including:

a) The development of capacity for local construction facilities;

b) Into the development of the power and raw material sources, into water supply;

c) For compensating for the losses caused by construction (for example, due to the inundating of land);

d) To protect the environment.

With new construction or a significant expansion of existing production, in addition to the direct and related productive capital investments, consideration should be given in determining both the overall and comparative effectiveness to the following:

e) Capital investments into the construction of housing, utility, cultural-service and other facilities essential for supporting and retaining the attracted labor force;

f) Expenditures on relocating the workers and their families;

g) Expenditures on the training of construction and operational personnel;

h) Capital investments into transport construction as well as current expenditures needed for the delivery of raw products and the transporting out of finished products and for handling passenger traffic.

The calculation of all these expenditures is carried out on the basis of the current standards for proportional capital investments and working capital accepted in the corresponding sectors, and in the absence of such standards, according to other consolidated indicators.

10. In analyzing capital investment effectiveness, it is essential to consider the average time gap (lag) between the making of the capital investments and the obtaining of the effect; as a whole for the national economy this is 2-3 years.

The procedure for determining the lag and using it in the calculations is set in the sectorial instructions on the basis of data on the duration of construction and the allocation of capital investments over the years of building the enterprises and projects, the reaching of designed capacity, and other technical and economic indicators for the enterprises and projects. In calculating capital investment effectiveness over the long run, it is essential to consider the probability nature of the investment process (see Points 33, 68).

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[2]In the event of adding the direct and related capital investments, the product or the work of the related sectors is included in the cost calculation.

11. In calculating the effectiveness indicators, one should ensure the fullest possible comparability of the effect and the capital investments. In calculating the capital investments, costs, operating expenditures, net product, as well as the additional indicators, one applies the prices, rates, wage scales and other price-forming standards in effect at the moment of carrying out the calculations. For the calculations and feasibility studies in the 11th Five-Year Plan, prices are to be employed using the price lists to be put into effect in 1982. For converting to the fixed estimate prices to current prices, it is permissible to apply coefficients for the expenditure elements or the indices for the estimated cost of construction-installation work and the cost of equipment for the project as a whole.

To the effect from the capital investments into the given project, it is also possible to add the effect which could be obtained from the incorporation of this project into the integrated economic development of the Union republic, the economic region, or into a territorial-production complex or industrial center.

For the extracting sectors of industry as well as for other sectors with a substantial annual withdrawal of existing fixed capital and capacity, for analytical purposes indicators are calculated for capital investment effectiveness minus the investments going to compensate for the planned withdrawal of the capacity and capital.

12. For the purposes of the thorough study and analysis of the economic effectiveness of capital investments and for disclosing the specific reserves for increasing their effectiveness, in decision taking use is also made of the indicators which describe individual aspects of the effect to be obtained, such as: labor productivity, the return on investment, proportional capital investments, the saving of material expenditures (with the isolating of the savings of metal, fuel and energy), and product costs. In addition, consideration is given to the improvement in the structure and organization of production, the introduction of the achievements of scientific and technical progress, shifts in the location of capital construction projects, the accelerated time for reaching the planned indicators for completed capacity at new and reconstructed enterprises, as well as other aspects of the effect of the capital investments on improving construction, and on the economic and social development of the sectors, the regions and the nation as a whole.

II. Overall (Absolute) Economic Effectiveness of Capital Investments

13. Determining the overall (absolute) economic effectiveness of capital investments is carried out in all stages of planning for the entire national economy, for the economy of the Union republics, for the national economic sectors, for the sectors of industry, agriculture, transport and construction, for the ministries, departments, economic associations and individual enterprises, in designing individual construction projects and facilities, in working out individual socioeconomic problems of developing the national economy and its sectors, as well as in assessing the results of carrying out the capital construction plans and other measures.

The calculations of absolute capital investment effectiveness provide an opportunity to obtain the overall amounts of the economic effect, and are employed in clarifying the amounts of national income for the purposes of establishing the possible national economic development rates and increasing the prosperity of the people, as well as in planning the volume of normed net product for the sectors, subsectors,

associations and enterprises, and in determining the results of the cost accounting activities of the enterprises, associations and individual ministries.

14. The indicators obtained as a result of the calculations for the overall (absolute) economic effectiveness of capital investments are compared with the standards and with the analogous indicators for the preceding period, as well as with the indicators for production efficiency at the leading associations and enterprises of the corresponding sectors. The capital investments are considered economically effective if the indicators obtained for them for overall effectiveness are not below the standards and the report indicators for the preceding period. Here the economic effectiveness of capital investments at existing associations and enterprises should not be lower than the level which would provide for paying the capital payment, interest on bank credit, rent and other fixed payments, for forming the development and incentive funds of the associations and enterprises, as well as for paying the established profit deductions to the budget.

The norm for the overall (absolute) effectiveness is: a) for the national economy, its sectors and subsectors, as well as for the Union republics and regions of the nation--the ratio of the effect in the form of the increase in national income or the rise in net (and normed net) product to the capital investments and which should be achieved in the planned period; b) for the self-financing associations, enterprises, their parts and individual capital construction projects, where normed net product is not calculated--the ratio of profit or the savings in costs to the capital investments into these projects.

The norms of overall (absolute) capital investment effectiveness are set by the USSR Gosplan in accord with the five-year planning system established by the Decree of the CPSU Central Committee and the USSR Council of Ministers of 12 July 1979, No 695, as well as for the long-range plans for 10-20 years, as follows: a) for the national economy as a whole, and b) differentiated for the individual sectors (subsectors) as well as for the allocations of capital investments (new equipment, environmental conservation, and so forth) in the sectorial and specialized instructions.

Of particular significance are the effectiveness norms set for a five-year plan as the chief form of planning and the basis for the entire system of economic management. The overall effectiveness norm is set on a level which ensures the increase set for the given planning period for national income (net product) of the national economy and its sectors, as well as for the net product (normed) of the subsectors, associations and enterprises. The norms of the overall (absolute) effectiveness for the sectors, subsectors, associations and enterprises should be set on the basis of the effectiveness indicators of the leading enterprises considering the prospects for introducing the achievements of scientific and technical progress into production, but, as a rule, on a level not lower than what was actually achieved for the preceding report period. For the 11th Five-Year Plan, the norm of overall (absolute) effectiveness for the national economy as a whole has been set on the level of what was actually achieved in the Tenth Five-Year Plan, that is, $E_a = 0.14$. For the national economic sectors, the norms of overall (absolute) effectiveness are set on the following levels: for industry $E_{ai} = 0.16$; for agriculture $E_{aag} = 0.07$; for transport and communications $E_{atc} = 0.05$; for construction $E_{ac} = 0.22$; for trade, procurement, material-technical supply and other sectors $E_{atpm} = 0.25$.

The norms for overall (absolute) effectiveness should be revised and this should be timed to the periods of compiling the five-year plans. Over the long run their amount should rise in keeping with the growth of labor productivity, technical progress, and the decline in the material and labor intensiveness of products.

In calculations over the long run of 10-20 years, norms for overall effectiveness should be applied as set for these purposes by the USSR Gosplan.

15. The planned effectiveness norms for use in examining and establishing capital investment effectiveness for production complexes, construction programs, and individual technical and economic problems of national economic development should be calculated as average weighted amounts in accord with the sectorial composition of these complexes, programs and technical-economic problems on the basis of the corresponding sectorial planning norms. A change in the sectorial planning norms for use in calculating capital investment effectiveness in construction with an extended construction time is made considering the forecasted prices for the products which are to be produced under these construction programs with the approval of the USSR Gosplan.

16. In calculating the overall (absolute) economic effectiveness of capital investments, the following indicators are to be employed as obtained from planning, design and report data:

a) For the national economy as a whole, its sectors and for the Union republic economy Z_{ne}, that is, the ratio of the annual increase in the volume of produced national income (net product) in comparable prices (ΔD) to the production capital investments which have caused this increase (K)

$$Z_{ne} = \frac{\Delta D}{K}. \qquad (1)$$

The value of Z_{ne} should be compared with the norm of the overall (absolute) effectiveness E_a and if $Z_{ne} > E_a$, then the designated capital investments are recognized as effective.

b) For the sectors of industry, agriculture, transportation, communications, construction and trade, for the comprehensive capital construction programs, and for the individual technical and economic problems Z_{np}--the ratio of the increase in the annual volume of net product to the capital investments which have caused this increase

$$Z_{np} = \frac{\Delta NP}{K}, \qquad (2)$$

where: ΔNP--the increase in net product.

The amount of Z_{np} should be compared with the sectorial norm of overall (absolute) effectiveness E_{np}, and if $Z_{np} > E_{np}$, then the designated capital investments are judged effective.

c) For the subsectors, types of production, ministries (departments), the economic associations and enterprises, as well as for the comprehensive material production

development programs, the ratio of the increase in the annual volume of net product (normed) to the capital investments which have caused this increase, that is,

$$Z_{np(n)} = \frac{\Delta NP_{(n)}}{K}, \tag{3}$$

where: $\Delta NP_{(n)}$--increase in net product (normed).

The amount of $Z_{np(n)}$ should be compared with the corresponding norm of the overall (absolute) effectiveness $E_{np(n)}$, and if $Z_{np(n)} > E_{np(n)}$, then the designated capital investments are considered effective.

d) For the self-financing subsectors, associations and enterprises, particularly in utilizing internal funds and bank credits, as the effectiveness indicator one uses the capital investment profitability defined as the ratio of the increase in annual profits to the capital investments causing this increase

$$Z_p = \frac{\Delta P}{K}, \tag{4}$$

where: ΔP--the increase in profit caused by the capital investments.

The amount of Z_p should be compared with the corresponding norm of overall (absolute) effectiveness (profitability) E_p, and if $Z_p > E_p$, then the designated capital investments are considered effective.

e) For newly constructed enterprises, shops, other projects and individual measures, the profitability indicator is also defined as the ratio of profit to the capital investments, and calculated from the expression

$$Z_{pp} = \frac{P-C}{K}, \tag{5}$$

where: K--the estimated cost of the project under construction (capital expenditures for carrying out the measure);
P--the annual product output (according to the plan) in enterprise wholesale prices (minus the turnover tax);
C--the cost of the annual product output.

The obtained amount Z_{pp} is compared with the profitability norm E_{pp}, and if $Z_{pp} > E_{pp}$, then the designated capital investments are effective.

f) For the sectors and enterprises where an indicator for the reduction in costs and also calculated prices are used, as well as for the planned loss enterprises, the indicator of the overall (absolute) economic effectiveness is characterized by the ratio of the savings from the reduction in product costs to the capital investments which cause this savings

$$Z_c = \frac{C_1-C_2}{K}, \tag{6}$$

where: C_1 and C_2--product costs, respectively, before and after carrying out the capital investments.

The value of Z_c is compared with the corresponding sectorial norm E_c, and if $Z_c > E_c$, the designated capital investments are judged effective.

g) For long-range comprehensive programs, it is recommended that the effect obtained as a result of carrying out the programs be set in a running total, with the stipulating of the period during which the total effect compares with or exceeds the total capital investments. For programs carried out using credits or the internal funds of an enterprise, association or sector, the volume of profit obtained over an analogous period is also assessed in a running total. The period set in this manner is considered the conditional period of the repayment of capital investments

$$\sum_{t=1}^{T} P_t = K \tag{7}$$

where: T--the capital investment repayment period;
P_t--the volume of profit obtained in year t;
K--capital investments.

17. Consideration of the time factor in setting the overall (absolute) capital investment effectiveness, in addition to calculating the lag, also consists in calculating the losses from the freezing of nonfunctioning capital investments over the (entire) period of construction and starting up using the corresponding sectorial norm for overall effectiveness

$$Y_{fr} = \sum_{1}^{t} E_{sp}(K_{nni} + K_{fri-1} - K_{fi}), \tag{8}$$

where Y_{fr}--the total losses from the freezing of investments;
K_{nni}--capital investments of year i (in a running total);
K_{fri-1}--losses from the freezing of nonfunctioning capital investments in previous year;
K_{fi}--capital investments functioning in year i (that is, providing an effectiveness on the level of the sectorial planned norm);
t--the total time from the beginning of construction until the reaching of designed economic indicators;
E_{sp}--the sectorial planned norm for the overall effectiveness (for net product of profit).

If losses are considered from the freezing of capital investments only for the above-norm construction period, then

$$Y_{fr} = K_{t_{cn}} E_{nr} t_{cn} + K_{t_{cn}-1} E_{nr}(t_{cn-1}) + K_{t_{cn}-2} E_{nr}(t_{cn}-2) + \ldots + KE_{nr}, \tag{9}$$

where: K_t, $K_{t_{cn}-1}$, $K_{t_{cn}-2}$--capital investments of each year after the completion of the normed construction time;

t_{cn}--the construction time above the normed;
K--capital investments of the last year of construction;
E_{nr}--the norm for adjusting expenditures of different times (see Point 25).

The calculation of losses from the freezing of investments is used only in determining the overall (absolute) economic effectiveness of the capital investments, and cannot serve as a basis for a change in the estimated construction cost.

18. In determining the overall (absolute) capital investment effectiveness, an analysis is made of the factors which influence a rise or decline in effectiveness.

Among such factors are:

a) The change in the labor intensiveness of the product providing an opportunity to free manpower as a result of the capital investments or requiring the addition of a labor force considering expenditures on the creation of the entire necessary social infrastructure such as housing, cultural and service facilities, and so forth, expenditures on training personnel, as well as considering the changes in working conditions;

b) The change in the material intensiveness of the product which frees additional resources of the means of production in the national economy or increases the expenditure of these resources;

c) The change in the capital intensiveness of the product which saves capital investments or causes their overexpenditure;

d) The change in quality (durability, reliability, and so forth) of a product leading to a change in the capital and current expenditures on satisfying the demand for this product;

e) The shortening of the construction time and the reduction in the estimated cost of construction.

19. The indicators for the overall (absolute) economic effectiveness for the use of existing fixed productive capital are determined as follows:

a) For the national economy as a whole, its sectors and the Union republic economy, as the ratio of the annual volume of national income (net product) to the total of the average annual productive capital (fixed and working)

$$Z_f = \frac{D}{F}; \tag{10}$$

b) For the sectors (subsectors) of industry, agriculture, transportation, and construction, for the associations, enterprises and projects, as the ratio of the net product (normed) to the total productive capital (fixed and working) according to the expression

$$Z_f = \frac{NP}{F}, \tag{11}$$

where: F--the average annual value of the fixed productive capital and normed working assets.

Profitability is defined as the ratio of profit to the same total capital:

$$Z_{rf} = \frac{P}{F}. \qquad (12)$$

Moreover, the return on investment is determined for the product output in physical units in terms of gross and commodity product and for the other production results reflecting the particular features of the use of productive capital in the individual sectors.

In all instances, the indicators for the return on investment should be supplemented by calculations for the change in costs for a full description of the effective use of the fixed capital.

III. Comparative Economic Effectiveness of Capital Investments

20. The calculations of the comparative economic effectiveness of capital investments are employed in comparing variations of economic and technical decisions, in locating enterprises and their complexes, in selecting interchangeable products, in introducing new types of equipment, in building new enterprises and reconstructing existing ones, and so forth.

21. The minimum adjusted ["privedennyy"] expenditure is an indicator for the best variation determined on the basis of the comparative economic effectiveness of capital investments.

The adjusted expenditures for each variation represent the total current expenditures (costs) and the capital investments adjusted for a uniform base in accord with the effectiveness norm.

$$C_i + E_n K_i \rightarrow \text{minimum}, \qquad (13)$$

where: K_i--capital investments for each variation;
C_i--current expenditures (costs) for the same variation;
E_n--the normed coefficient for comparative effectiveness of capital investments.

The adjusted expenditures can also be calculated from the following fomula:

$$K_i + T_n C_i \rightarrow \text{minimum}, \qquad (14)$$

where: T_n--the normed period for the repayment of additional capital expenditures from savings in costs, the amount inverse to E_n.

With a limited number of variations, it is possible to have their sequential coupled comparison using the following formulas:

$$E = \frac{C_1 - C_2}{K_2 - K_1}; \qquad T = \frac{K_2 - K_1}{C_1 - C_2}, \tag{15}$$

where: E--coefficient of comparative effectiveness;
T--the repayment time for additional capital investments by the savings in cost;
K_1, K_2--capital investments for the compared variations;
C_1, C_2--costs for the compared variations.

If $E > E_n$ or $T < T_n$, then the additional capital investments, and consequently, the more capital-intensive variation, are effective.

The indicators K_1 and C_2 can be employed both in the full amount of the capital investments and costs of the annual product, as well as in the form of proportional amounts: the proportional capital investments per unit of product and the cost of a unit of product, with the obligatory observance of the full comparability of the variations, and this is based upon the equality of the consumer effect.

All the compared variations for capital investments should be adjusted in a comparable form for all features (for the volume of product, its composition, quality, manufacturing times, as well as for the social effects, including environmental conservation), in addition to the feature the effectiveness of which is being determined. The comparability of the variations can be achieved on the basis of the calculations and expenditures for creating "supplementary" capacity and other calculations the procedure for which is determined by the sectorial instructions, as well as by the instructions for the effectiveness of individual uses of capital investments.

22. The normed coefficient of comparative effectiveness for the national economy as a whole is to be kept during the 11th Five-Year Plan on a level not lower than 0.12. This norm designates the minimum reduction in cost per unit of additional capital investments (that is, their difference according to the variations) whereby these additional capital investments can be judged effective. The designated norm is designed to correlate only incremental values, and should not be identified with the overall effectiveness norm and also cannot be used for the interchangeability of the full amounts of one-shot and current expenditures. When necessary, out of considerations of encouraging technical progress, in considering the different wage levels (zonal and sectorial), the differences in price levels, the length of construction programs and regional differences, for individual regions and sectors deviations are permitted from the normed effectiveness coefficient set for the entire national economy, and these are determined by the sectorial instructions and approved by the USSR Gosplan.

The deviations in the normed coefficient of comparative effectiveness should be such that it is not lower than 0.08-0.10 and not exceed 0.20-0.25. The norm of comparative economic effectiveness is subject to revision, and this should be timed with the periods of drawing up the five-year plans. In keeping with the absolute growth of accumulation, the amount of the comparative effectiveness norms can be reduced, since with an increase in accumulation there is a rise in the capital investment fund, and a broader range of projects can be carried out, including the more capital intensive variations of equipment.

23. In determining comparative economic effectiveness, as the initial indicators one should employ those of the best existing solutions to the given economic problem, and in introducing new equipment, the indicators for the best domestic and foreign equipment which has been introduced or is being worked out in designs. The indicators for the designated capital investment variations are compared with analogous indicators of the base projects and with the economic effectiveness indicators achieved in previous periods.

In determining the amount of the economic effect obtained from introducing the measure, under specific conditions, the initial indicators for comparison are those of the most widely found methods for solving the given problem, and in introducing new equipment, the indicators of the equipment being replaced.

24. In calculating the economic effectiveness of capital investments, comparability should be observed between the expenditures and the effect in the compared variations for the following:

a) For the range of enterprises and sectors of production;

b) For the time of the expenditures and the obtaining of an effect;

c) For the prices used in expressing the expenditures and the effect;

d) For the nature of the expenditures and the effect from the viewpoint of simple and expanded reproduction;

e) For the range of expenditures included in the volume of capital investments;

f) For the methods of calculating the value indicators used for figuring effectiveness, and for other factors.

25. In comparing the capital investment variations, if they differ in terms of the length of construction, the allocation of capital investments over the construction periods, or the possibility of building in stages without detriment to carrying out the production quotas, a calculation is run for the influence of the varying time of the capital investments on the effectiveness of the investment variations.

If for the compared variations the capital investments are to be made at different times, and the current expenditures change over time, then the variations must be compared by adjusting the expenditures of the later years to the current moment by employing an adjustment factor figured from the expression:

$$B = \frac{1}{(1 + E_{nr})^t}, \qquad (16)$$

where: B--adjustment factor;
t--period of adjustment time, in years;
E_{nr}--norm for adjusting expenditures of different times.

Under the conditions of the current procedure for calculating the amortization of fixed capital, the norm for adjusting expenditures of different times is to be kept at a level of 0.08.

The adjustment of expenditures of different times is used only in calculating the economic effectiveness of the variations, and cannot serve as justification for changing the estimated cost of construction.

26. In comparing variations which differ in terms of the length of construction, their comparability can be ensured either by an estimate using the adjustment factor, the losses from the freezing of investments (in completing the project in the same year for all the variations), or by considering the one-shot real effect in the form of additional net product or profit obtained with the more rapid completion of the project, considering the effects of the related sectors from utilizing the product obtained early.

27. The economic effectiveness of the capital investment variations, considering the regional differences, is determined by comparing the indicators of the adjusted expenditures and considering the related capital investments into transport and transport expenses in delivering the product to the consumption areas.

28. In comparing the technical and economic indicators of plans being worked out for enterprises and new equipment with the economic indicators of existing production, it is essential to correct the latter considering the change in them due to the planned better utilization of the existing productive capital by the time the plans are carried out.

29. In those instances when the designated variation involves an economic complex, its effectiveness is determined by a comparison with the alternatives which in isolation solve in the corresponding national economic sectors the same problems which are being solved with the variation of a complex. In the interests of economic accountability, the expenditures on the measures relating to the complex can be distributed between the individual sectors, associations and enterprises involved in the complex. The distribution is made by assigning each participant in the complex a share of the expenditures determined proportionately to the economic effect to be received by it from the integrated carrying out of the project or measure.

30. In sectors where production is based on the direct use of natural resources, including the extractive sectors, in the calculations of comparative effectiveness, it is possible to use the marginal (maximum acceptable) expenditures in assessing the new equipment as approved as a norm for a regular five-year plan in the established procedure.

31. In introducing new equipment which alters the quality and operating properties of the products to be produced, consideration should be given to changes in expenditures and the effect both in the production sphere as well as in the sphere of the use of the equipment. The economic effectiveness of capital investments with an improvement in the properties and qualities of the raw products and materials and with the creation of new types of them, is determined considering the capital investments and current expenditures in the production, transportation and use raw products and materials. The calculation should be made for the planned annual volume of the consumption of the materials.

32. The economic effect from the capital investments into the creation of new types of equipment, machinery, mechanisms and other implements of production and the improving of existing ones, in addition to the effect determined for the enterprise,

association or sector (subsector) producing the new equipment, is also realized at the places of their use (operation). The amount of this portion of the economic effect is determined by correlating the capital investments of the consumer on the acquisition of the designated equipment with the reduction in the cost of the product or the work carried out with the given equipment. Here consideration is also given to the changes in the labor, material and capital intensiveness of the product, the construction time and other factors. The complete amount of the effect represents the algebraic total of the effects of the producer and the consumer of the new equipment. In calculating the effectiveness, total expenditures of the producer and consumer are compared with this.

33. In comparing the variations, all the initial information on the expenditures and results for all the variations should be known with sufficient certainty. However, in individual instances and in the sectors (for example, agriculture), and particularly in long-range planning and forecasting and in the sphere of scientific research and experimental designing, a significant portion of the initial information is of a probable nature. In these instances, the minimum mathematical expectation of the values of the adjusted expenditures can be used as the effectiveness criterion.

IV. Particular Features of Determining the Effectiveness of Individual Uses of Capital Investments

A. Determining the Economic Effectiveness of Capital Investments into the Expansion, Reconstruction and Technical Reequipping of Operating Enterprises[3]

34. Proceeding from the task of planning current production and new construction as a single whole and from the provisions of the Decree of the CPSU Central Committee and USSR Council of Ministers of 12 July 1979, No 695, on sharply reducing the number of newly started construction projects, the effectiveness calculations for new construction should be made in an obligatory comparison with the effectiveness of the expansion, reconstruction and technical reequipping of existing enterprises. The effectiveness of expanding an existing enterprise carried out by creating new work areas basically on the former technical level should also be compared with the effectiveness of both new construction as well as with the effectiveness of reconstruction and technical reequipping of these enterprise. In these comparisons it is essential to consider the entire volume of capital investments, both production and nonproduction. Here it is essential to consider the expenditures (savings) related to the additional hiring of labor resources. The effects from the additional product volumes obtained as a result of the more rapid opening up of new capacity introduced at the expanded or reconstructed enterprises, in comparison with newly constructed ones, as well as the effect from releasing the workers as a result of reconstruction and technical reequipping, with the availability of information on use in other types of production, proceeding from the average volume of net product per

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[3]For more detail see "Metodicheskiye Rekomendatsii po Opredeleniyu Ekonomicheskoy Effektivnosti Kapital'nykh Vlozheniy v Deystvuyushcheye Proizvodstvo" [Procedural Recommendations on Determining Economic Effectiveness of Capital Investments in Current Production], Sverdlovsk, 1980.

employee in material production, should be considered in determining the overall amount of the effect from capital investments into reconstruction.

35. In calculating the economic effectiveness of work relating to the expansion, reconstruction and technical reequipping, it is essential to consider the social consequences of this such as the improving and easing of working conditions and environmental conservation. In instances when the achieving of social results is the basic purpose of reconstruction or technical reequipping, the solution to the question of the effectiveness of such work goes beyond the determining of the economic effectiveness of capital investments and should be carried out on a broader socioeconomic level.

36. The comparative economic effectiveness of capital investments for carrying out the expansion, reconstruction and technical reequipping of existing enterprises is determined by comparing the indicators for the variations of this work with the indicators of existing production as well as with the variations of new construction. Here it is essential to consider the losses in net product (normed) and profit, as well as the increase in current expenditures during the period of carrying out this work.

37. On the basis of the calculations of comparative effectiveness, the variation for one or another type of work is selected. In instances when reconstruction is carried out for the purpose of raising the technical level or reducing current production outlays, in maintaining the base volume of produced product, the effectiveness is assessed by comparing the savings from the reduction in costs with the capital investments which have caused it.

38. The effectiveness of work in the area of expansion, reconstruction and technical reequipping aimed at increasing capacity and raising product output is assessed by making a comparison with the following:

a) With the indicators of the designs of a new enterprise the product output of which equals the increase in the output as a result of this work;

b) With the indicators of an operating enterprise, if the comparison with the plans for building a new enterprise is impossible. In this instance, the effect of the capital investments is the savings from the reduction in product cost.

39. If expansion, reconstruction and technical reequipping are aimed at expanding the assortment and increasing product quality, a distinction must be made for:

a) The improvement in product quality;

b) The organizing of the output of new product types with the same consumer purpose as was previously produced.

The economic result in the first instance is not only the effect for the consumer, but also the growth of gross product with a relatively smaller increase in the current production outlays, and this causes not only an increase in profit but also a rise in production profitability. In calculating economic effectiveness for the second instance, the obtained economic indicators (capital investments and current expenditures) should be compared with the analogous indicators for the construction of a new enterprise.

40. The comparative economic effectiveness of the capital investment variations at existing enterprises which are to be made from money of the production development fund and bank credits for carrying out the measures of introducing new equipment, mechanization, automation and modernization of equipment, the replacement of fixed capital, the acquisition of means of transport, the improving of the organization of production and labor, and other measures, is determined by calculations for the increase in net product (normed), the increase in profit, or the decline in costs in comparison with the capital investments.

41. In the instance of carrying out work in the extracting industrial sectors aimed at the side recovery of valuable components from the mineral being mined, the assessment of capital investment effectiveness should be made by comparing them with the increase in net product or profit as a result of this work, as well as considering the national economic effect from the use of these valuable components.

42. If the work related to expansion, reconstruction or technical reequipping involves the liquidation of existing capital (or if its further use is unknown), the residual value of this capital (minus the amount from sales) is added to the corresponding capital investments (the total of which can be reduced by the amount of the value of the forthcoming major overhaul). The residual value is defined as the difference between the balance sheet value and the total paid-up amortization. If in introducing new equipment at existing production (automatic lines of new systems of equipment), all or a portion of the existing equipment continues to be operated, while a portion is transferred to other enterprises for effective use, the effectiveness is calculated proceeding from the difference of the fixed capital after the introduction of the new equipment (including the utilized capital of existing production) and the fixed capital of existing production prior to the introduction of the new equipment (with a comparable production volume).

43. In all instances of evaluating effectiveness and choosing variations for the reconstruction, technical reequipping and expansion of operating enterprises, the calculations are made not only by comparing expenditures for these purposes with the increase in the effect as a result of carrying out the work, but also considering the entire total of productive capital in the overall effect for the enterprise (project) as a whole after carrying out the work of expansion, reconstruction and technical reequipping.

B. Evaluation of Effectiveness for Capital Investments in the Nonproduction Sphere[4]

44. The effectiveness of capital investments as well as operating fixed capital in the nonproduction sphere (its sectors, complexes and individual installations) is determined by comparing the obtained social and socioeconomic results (effects) with the expenditures required for realizing them.

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[4]For more detail see "Metodika Opredeleniya Effektivnosti Zatrat v Neproizvodstvennuyu Sferu" [Procedure for Determining Effectiveness of Expenditures in Nonproduction Sphere], Moscow, 1979.

45. The effect of capital investments and other expenditures into the physical plant of the nonproduction sphere, its individual sectors and installations are expressed in the following:

a) Physical measurements as determined by the size of the projects planned for development or already developed (units of capacity, handling capacity, the seating capacity considering their quality);

b) Indicators for the coverage by one or another measure or type of service on the basis of developing the nonproduction-end projects: for example, housing area, the number of seats in theaters, movies or clubs, the number of beds in hospitals, the number of student places in schools and so forth, calculated per 1,000 persons, in observing the accepted standards for the cubic volume per seat, ceiling heights, amenities, lighting, air temperature, and so forth;

c) Relative measurements (points) reflecting a quality evaluation of the created or developed nonproduction-end project (for example, a point evaluation of the quality of housing, recreational or publi health facilities);

d) A value form (for example, the annual volume of the sale of services or product in established prices, or the amount of additional profit earned from developing the corresponding types of services).

46. Along with the social and socioeconomic results, consideration is also given to the direct economic effects of the capital investments into the nonproduction sphere:

a) The profit from the providing of services in the sectors and enterprises of the nonproduction sphere which operate completely or partially on the basis of cost accounting;

b) An increase in the annual sales volume of products or services in physical or cost units (including calculated per unit of capital investment).

These effects are compared with the capital investments which cause them. At the same time consideration should be given to the ancillary economic results which arise outside the nonproduction sphere and reflect the specific influence of its individual sectors on production.

The economic results are viewed as supplementary ones to the basic social and socioeconomic results which are of crucial significance.

47. The overall (absolute) effectiveness of capital investments in the nonproduction sphere is determined by relating the increase in the social and socioeconomic result to the capital investments required to achieve this result. If the increase can be expressed in a value form, then the amounts of the increments in the different results are totaled. The basic indicator for the effect of the expenditures in the nonproduction sectors and projects is the increase in satisfying the needs of the public for services due to the strengthening of the physical plant of the nonproduction sphere and the improvement of services on this basis.

In working out the social and economic development plans, the indicators for the overall (absolute) effectiveness are compared with the normed indicators and with the analogous, actually achieved indicators over the previous period.

If the effectiveness indicators in the planned (designed) social measures and socio-economic programs are below the normed or the actually achieved in the preceding period, then there must be additional analysis, the variant study of the measures and programs and calculations using methods of comparative effectiveness.

48. In assessing the effectiveness of the long-range specific socioeconomic programs, if the social result permits a direct measurement (in indicators for the improvement of social standards, a rise in the level or standards of consumption, coverage by various types of services, and so forth), it is recommended that the calculations be made for the integral effect in a running total. The calculating of the expenditures and the results starts with the first year of the expenditures. As the calculation period, one uses the time of the functioning of the program or a period (up to 1990 or 2000).

49. In the construction, reconstruction and expansion of projects or facilities of the nonproduction sphere using bank credit, the overall (absolute) effectiveness is determined proceeding from the increase in profit from the sale of the annual volume of products and services as obtained by the enterprises (institutions) in the non-production sphere functioning on the basis of cost accounting (facilities in consumer services, culture, recreation, tourism, public dining, and so forth). If the capital investments and the other expenditures into social-end projects are financed by production enterprises from the funds for sociocultural measures and housing construction with the use of a bank credit, then the calculation of the overall (absolute) effectiveness should include the ancillary economic effect which can be achieved on the basis of the given social measure.

50. Calculations of comparative effectiveness in the nonproduction sphere make it possible to establish capital investment variations. With the set expenditures limited by the existing financial resources, the variation is chosen on the basis of the maximum achieved social result. In assessing complex social results which cannot be directly given a quantitative evaluation, for a comparison and selection of the variations, it is recommended that the complex concept be broken up into the elements which form it and which allow a conditional quantitative evaluation.

51. With an identity of the social results in the different variations of developing the nonproduction sphere, the choice of the best variation is made from the minimum of the adjusted expenditures considering the ancillary economic and social effect which cannot be measured economically.

A comparison for the minimum adjusted expenditures can be employed both in the form of the full total of current expenditures and capital investments as well as the proportional expenditures per unit of the calculated social indicator, for example, per place in public health, cultural and educational projects or children's institutions under the condition of the complete comparability of the results. Here there should be a complete equivalence of the compared variations in terms of the level of comfort, the living conditions and the aesthetic properties. This comparability is achieved by employing compulsory sociocultural norms (standards of living) in the designing. Such norms include: the effective and total area and cubic volume

per person, the standards for humidity and temperature conditions, illumination, domestic consumption of water, electric power, gas, the number of places in schools, children's institutions and hospitals per 1,000 of the population, and so forth, according to the range of indicators set in the sectorial instructions.

The density of the population, landscape area, the standards for the purity of the air basin, and so forth are the standards of living for the urban development complexes. The complete range of sociocultural norms for various projects is established in the appropriate sectorial procedures.

52. In the feasibility study for enterprises involved in serving the public (trade, public dining, consumer services, passenger transport, communications, public health, recreation, and administration), the effectiveness calculations should provide an evaluation of the expenditures of time by the population on using the appropriate services, proceeding from a time norm equal to 0.5-0.7 rubles per hour, considering the regional working conditions.

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INDUSTRIAL EFFICIENCY, TECHNICAL PROGRESS STRESSED

Ways to Raise Production Efficiency

Moscow EKONOMICHESKAYA GAZETA in Russian No 51, Dec 80 p 2

[Unattributed article: "Increasing the Efficiency of Social Production"]

[Text] A continuous growth in the efficiency of social production is an indelible trait of an economy of developed socialism. This is a key question in the economic policy of the CPSU, a key problem the solution to which determines the successful carrying out of the grandiose program of economic and social development in the nation.

At the June (1980) Plenum of the CPSU Central Committee, L. I. Brezhnev commented: "We have posed for ourselves the fundamental task of increasing production efficiency and work quality. It should be constantly in our view."

A rise in the efficiency of social production is expressed in the growth of national income. Over the last three five-year plans, this has more than doubled. During the Tenth Five-Year Plan, four-fifths of national income was used directly for consumption, housing and cultural construction. Here 329 billion rubles more than in the Ninth Five-Year Plan were allocated for increasing the standard of living of the people. Productivity of social labor during the Tenth Five-Year Plan rose by 17 percent. In 1976-1979 alone, there was a savings of the labor of 12.5 million persons.

In industry, during the Tenth Five-Year Plan, 75 percent of the increase in product came from a rise in labor productivity, all the increase in product in agriculture, and 90 percent of the increase in construction-installation work in construction.

The material intensiveness of social product has declined. In 1976-1979, the savings of raw products, materials, fuel, energy and other subjects of labor was around 10 billion rubles.

However, along with the achieved positive results in the area of increasing production efficiency, there have also been substantial shortcomings and major reserves. In a number of sectors there has been a lag in the growth of labor productivity, the allocated resources have not been used with sufficient efficiency, while wastes and losses of metal and fuel have been reduced slowly.

The elimination of these shortcomings would make it possible to accelerate the growth rate of the efficiency of social production.

In the 1980's, the Communist Party will consistently continue to carry out its economic strategy. The Draft of the CPSU Central Committee "Basic Directions in the Economic and Social Development of the USSR for 1981-1985 and for the Period Up to 1990" provides in the new decade for "further economic progress of society, profound qualitative shifts in the material and technical base by the intensification of social production, a rise in its efficiency and the acceleration of scientific and technical progress."

In the forthcoming decade, in line with this, there are plans to complete the conversion of the economy to the path of intensive development, to raise the organization of social labor to a higher level, and to concentrate the forces and resources on solving the basic national economic problems. Great importance is being given to progressive shifts in the national economic structure and to improving the intersectorial and intrasectorial proportions.

In the draft Basic Directions, a further rise in production efficiency is viewed as the decisive and most effective means for multiplying the national wealth of the country, and for the rapid growth of socialist accumulation and consumption resources. These program demands have been reflected in the main task of the 11th Five-Year Plan, where emphasis is put on the importance of the more rational use of the nation's production potential, the greatest possible savings of all types of resources and an improvement in the quality of work.

The party has called for a steady rise in the efficiency of social production and an improvement in the quality of product and services in all the national economic sectors on the basis of the all-round intensification of production. The task has been posed of achieving the most rational utilization of the material, labor and financial resources as the major condition for the successful, dynamic development of the national economy and the growth of the well being of the people. This should be expressed in a rise in labor productivity, an increase in the return on fixed capital, a decline in material intensiveness of production in all the national economic sectors, a rise in product quality and a decline in product costs.

Labor productivity is the most important indicator of production efficiency. In the draft of the Basic Directions in the 11th Five-Year Plan there are plans to increase the productivity of social labor by 17-20 percent, and by this achieve at least 85-90 percent of the increase in national income, that is, significantly more than was obtained from this factor in the Tenth Five-Year Plan. In many sectors the task has been set of achieving the planned increase in the production volume basically by raising labor productivity. This applies to such sectors as oil refining, the coal and fishing industries, and nonferrous metallurgy.

During the 11th Five-Year Plan, labor productivity in industry will increase by 23-25 percent, and from this more than 90 percent of the increase in product should be obtained. In agriculture, labor productivity in social production should rise by 22-24 percent.

For increasing labor productivity in all the national economic sectors, a broad system of measures has been planned. First of all there is to be a rise in the

equipment-to-labor ratio, the widest introduction of full mechanization and automation of production, and a steady decline in the number of persons employed in manual labor, particularly in auxiliary and subsidiary jobs. Of important significance also is a further improvement in labor norming and incentives. The scientific organization of labor should be steadily introduced everywhere, and the effectiveness of this measure increased. Major reserves should be realized by the rational utilization of working time and eliminating losses, by strengthening labor discipline and reducing personnel turnover.

An increase in the return on investment serves as one of the general indicators characterizing production efficiency. The more efficiently equipment and operating productive capacity are used, the higher the return on investment, and the more product and national income produced per ruble of fixed productive capital.

The draft of the Basic Directions provides for the implementing of measures aimed at raising the return on investment in the national economic sectors and in the associations and enterprises. Large reserves for increasing the return on investment should be discovered and mobilized from the rational use of production capacity, from widely introducing highly productive equipment, improving the structure and promptly renovating equipment. The party pays particular attention to the necessity of reducing the time for reaching designed capacity at newly completed enterprises and projects, increasing the shift factor at work, more rapidly replacing obsolete equipment, and reducing proportional capital investments. The draft also provides for the stiffening of demands on the efficiency and rapid repayment of new equipment and products from new enterprises.

A reduction in the material intensiveness of production is of major national economic significance. This is expressed in a reduction in the expenditure of raw products, materials, fuel, energy and other material outlays per unit of produced product. In a number of sectors it is important to increase product output per unit of consumed raw material. The draft also poses the task of economically utilizing all types of material resources. Over the five-year plan it has been envisaged that the savings of fuel and energy resources in the national economy will amount to 160-170 million tons of conditional fuel units, including 70-80 million tons by reducing the consumption standards. In machine building and metalworking, the proportional consumption of rolled ferrous metals should be reduced by an average of at least 18-20 percent, for steel pipe by 10-12 percent, and for rolled nonferrous metals by 9-11 percent. In construction it is essential to provide a savings of 7-9 percent for ferrous rolled metals and lumber, and 5-7 percent for cement.

The reduction in material intensiveness and the economic utilization of material resources should be aided by the introduction of the most efficient material-, fuel- and energy-saving production processes, and in particular, waste-free production methods, and the integrated processing of raw products and materials. The attention of labor collectives is to be drawn to increasing thriftiness, to improving norm setting, accounting and control over the use of material resources. A significant effect is to be attained by the wide employment of secondary material and fuel-energy resources as well as side products in economic circulation. In each sector, association and enterprise, measures should be worked out and implemented to eliminate all possible losses and reduce the wastes of material resources.

The carrying out of the course of increasing production efficiency is organically linked with a continuous improvement in product quality in accord with the present demands of national economic development and scientific-technical progress, as well as with the growing demands of the population. There are plans to steadily increase the proportional amount of superior quality product in the total volume of product output, and to introduce comprehensive quality systems everywhere.

In the new five-year plan, particular attention is to be given to the quality of the consumer goods. For these purposes there are plans to work out and implement measures to equip the sectors, enterprises and shops which produce consumer goods with highly productive equipment and advance production methods, as well as to more fully supply them with high grade raw products and materials. In light industry, in particular, there are plans to increase the output of high quality goods which are in increased demand. The task has been established of expanding the assortment and improving the quality of children's goods.

The draft of the CPSU Central Committee for the 26th Party Congress also plans an improvement in the other indicators of production efficiency. Tasks have been set of increasing profitability, raising profits, and accelerating the turnover rate of working capital. The necessity has been stressed of paying particular attention to reducing product costs, and to substantially strengthening the role of this indicator in assessing operations and encouraging the collectives of the enterprises and associations.

During the 11th Five-Year Plan there are plans to reduce the costs of products and work, to increase profit in industry and construction by approximately 1.3-fold, and by 1.7-fold on the sovkhozes, as well as accelerate the turnover rate of working capital in the national economy by 2-3 days.

The tasks of increasing production efficiency in the forthcoming period are to be carried out in an inseparable link with and on the basis of consistently introducing an entire range of measures to improve the economic mechanism and to upgrade the style and methods of economic leadership. An essential condition for increasing production efficiency and work quality is the ubiquitous introduction of advanced production experience and a further rise in the socialist competition.

The draft of the CPSU Central Committee stresses: "To sharply increase production efficiency and to put all reserves into serving the national economy are the duty of the party, state and economic bodies, all public organizations, labor collectives and each Soviet person." Each labor collective should view the policy of increasing efficiency as a vital matter for it and as an indispensable condition for successful advancement. The higher the labor results and production efficiency the stronger the might of the socialist motherland, the more fully personal and social needs are satisfied, and the higher the standard of living of the people.

Aspects of Scientific and Technical Progress

Moscow EKONOMICHESKAYA GAZETA in Russian No 52, Dec 80 p 2

[Unattributed article: "Accelerating Scientific and Technical Progress"]

[Text] The party sees in the accelerated pace and expanded scale of scientific and technical progress one of the chief levers making it possible to successfully carry

out the entire complex of political, economic and social tasks confronting the nation, and above all the tasks which ensure a rise in the economic might of the country, the greatest possible rise in production efficiency, and greater prosperity of the people. In carrying out the party's economic strategy elaborated by the 24th and 25th CPSU congresses, the Soviet people have ensured a further rise in the scientific and technical potential of the nation. Over the years of the Tenth Five-Year Plan, the pace of scientific and technical progress has accelerated, the scale of introducing new technology has risen in the national economy, and the technical level of production has increased.

As an annual average, during the Tenth Five-Year Plan, 3,400 new types of machines, equipment, devices and instruments have been developed in production and series output started, in comparison with 3,300 in the Ninth Five-Year Plan. As an annual average, 1,800 obsolete machines, types of equipment, units, instruments and products have been taken out of production, in comparison with 1,500 in the Ninth Five-Year Plan. Over the previous period, an annual average of 4 million inventions and rationalization proposals have been employed in comparison with 3.7 million in the Ninth Five-Year Plan. In 1976-1979, over 22,000 mechanized flow [assembly] lines and 7,200 automated lines were put into operation. The number of fully mechanized and automated sections, shops, production lines and enterprises rose by 18,200. Over the 4 years, 1,677 automated control systems were put into service.

Our nation is entering the 1980's with a strong scientific and technical potential. In the forthcoming decade, as is stressed in the Draft of the CPSU Central Committee "Basic Directions of Economic and Social Development of the USSR for 1980-1985 and for the Period Up to 1990," it is essential "to ensure further economic progress of production, profound qualitative shifts in the material and technical base on the foundation of the intensification of social production, a rise in production efficiency and the acceleration of scientific and technical progress." Thus, the party views the tasks of the intensification and effectiveness of production and the acceleration of scientific and technical progress in an organic unity.

The development of science and technology, as is stated in the draft, during the 11th Five-Year Plan should even more be subordinate to solving the major problems of progress in Soviet society, and to accelerating the conversion of the economy to a path of intensive development. In all sectors of the national economy it is essential to consistently carry out a policy of more rapid technical reequipping of production, and developing and producing machinery and equipment making it possible to improve working conditions and raise labor productivity, and more economically utilize the material resources.

In the area of technical policy, the task has been set of consistently converting to the mass use of highly efficient systems of machines and production processes which provide full mechanization and automation of production and the technical reequipping of its basic sectors. Emphasis has been put on the necessity of creating and introducing fundamentally new equipment and materials as well as progressive production methods into production. On the basis of utilizing scientific and technical achievements, it has been planned, for example, to develop the production of automatic manipulators. Production is to be expanded for new polymer and composition materials and products from them with a range of preset properties. Attention

is also to be paid to the use of efficient, low-waste and waste-free production processes, laser, radiation and other progressive methods for working metals and materials and providing opportunities to further increase production efficiency.

The draft of the CPSU Central Committee plans a rise in the technical level of all sectors, particularly auxiliary and service production. Great attention is to be given to a rise in the equipment-to-labor ratio, and to the greatest possible introduction of full mechanization and automation of the production processes. For these purposes there are plans to increase the output of complete machine systems for the full mechanization and automation of production.

A characteristic feature of the technical reequipping of production during the coming period should be the broader use of machines and units with a high unit capacity and productivity. Special attention is to be paid to the necessity of improving the structure and promptly replacing fixed capital in use, and more rapidly removing obsolete equipment. Of major significance for increasing the technical level of production is the reconstruction of enterprises. Considering this, capital investments should be channeled first of all into the reconstruction and technical reequipping of existing production. Even in 1981, there are plans to increase capital investments for technical reequipping and reconstruction of enterprises by 11 percent in comparison with the 1980 plan.

The acceleration of scientific and technical progress at the same time is inseparably linked with major qualitative, structural shifts in the national economy. The party is drawing attention to the necessity of improving the intersectorial and intrasectorial proportions, and of continuing the more rapid development of the sectors which determine scientific and technical progress. The task has been posed of improving the structure of the fuel and energy complex and the structural materials complex by the more rapid growth of production for the most progressive product types.

The party pays most important significance to the questions of fuel and energy. As was stressed in the greetings of L. I. Brezhnev to the workers, engineers, technicians and white collar personnel of the energy systems, enterprises and construction projects, and to all the power workers, machine builders and employees of the fuel sectors of Soviet industry, we should begin to carry out a new energy program designed for the next few years and long run. This program envisages a qualitative change in the structure of the fuel and energy complex primarily by a rise in the share of nuclear power, the building of large thermal power plants based on strip-mined coal deposits, and a further use of hydropower resources in the energy balance, considering their integrated use.

The Communist Party is showing great concern for the development of metallurgy. In order to satisfy the needs of the national economy, during the 11th Five-Year Plan it is essential to provide a decisive swing to quality and the saving of metal. For this reason there are plans to have not a qualtitative increase in output as a fundamental improvement in the quality and a broadening of the assortment of metal products. In this regard, important significance is being given to the introduction of new production processes, to the wide use of large oxygen converters and electric furnaces, to continuous steel casting and to raising the share of economic types of rolled metal. In ferrous metallurgy, the volume of continuous steel casting will reach 35-37 million tons, and the output of electric steel will rise by 1.6-fold.

The share of progressive structural materials will rise significantly in total output over the 11th Five-Year Plan. For example, in metallurgy the output of powdered metals will rise by more than 3-fold, and cold-rolled sheet, rolled products with strengthening heat treating, and shaped and high-precision rolled products by 1.5-2.5-fold.

The increase in the output of progressive structural materials should be combined with their rational use. Thus in the metal-consuming sectors, for example, in machine building, great reserves for saving metal can be found in reducing the metal intensiveness of the produced machines and equipment, and employing progressive methods for working metals, precision stock and metal substitutes which reduce wastes.

The party gives particularly great attention to the introduction of chemistry into the national economy and the development of this sector. "Without modern heavy chemistry," stated the October (1980) Plenum of the CPSU Central Committee, "at present there can be no effective economy." The production of synthetic resins and plastics, for example, in the 11th Five-Year Plan will reach 6.25 million tons. The output of plastic pipe will increase, and this will make it possible to save a large quantity of steel pipe.

Machine building is the basis of technical progress in the national economy and the foundation for the modernization and technical reequipping of all sectors. The volume of machine building and metalworking products will increase by at least 1.4-fold. The party demands a consistent solution to the problem of creating and introducing highly efficient systems of machines making it possible to comprehensively increase efficiency in stages of production, starting from the extraction of raw materials and including the subsequent stages of manufacturing, processing and transporting the products.

There is to be a significant increase in the pace of replacing the produced equipment, and this will make it possible to more rapidly equip and modernize all other sectors based on the most modern equipment. Here there should be a significant improvement in all the technical and economic parameters of the machines and equipment. For example, the productivity of metal cutting machines, forging-stamping equipment, foundry and woodworking equipment should rise by 1.3-1.6-fold. There must be a rise in the economicness, reliability and durability of the machines and equipment. The precision of metal cutting machines should rise by 20-30 percent.

The tasks of accelerating scientific and technical development have been formulated in close relationship to the specific areas of improving planning, management and the organization of scientific and technical progress, and increasing the efficient use of the scientific and technical potential. There are plans to substantially shorten the time required to develop and introduce new equipment, as well as to strengthen the reciprocal ties between science and production.

The party gives great significance to the elaboration and implementation of specific comprehensive programs. Wider use must be made of the specific comprehensive programs as the organic component parts of the state long-range economic and social development plans. It is important to raise their soundness, their focus on the end results and the solving of specific-technical, economic and social problems, as well as create and employ efficient systems for managing such programs.

The task has been posed of strengthening the responsibility of the ministries and departments for the level of research in the sectorial scientific institutions, and for rapidly utilizing the results of completed scientific developments in production. An improvement of the work in the scientific research and design organizations will be aided by the measures to strengthen their physical plant, to increase production of instruments and automation, as well as measures to improve the training and increase the skills of scientific personnel. At the same time it is essential to improve the system for evaluating the technical level of the articles being developed and produced, and to upgrade the standards and technical conditions for finished products, preassembled articles, materials and raw products.

The scientific research, design and engineering organizations, the associations and enterprises must increase the effectiveness of the cost accounting system for organizing work in the area of creating, developing and introducing new equipment on the basis of schedule orders.

The fruits of scientific and technical progress in our country are employed for the interests of all society and for the good of each Soviet man.

Of particular significance are the opportunities which have been opened up due to the acceleration of scientific and technical progress for strengthening the creative nature of work, and for carrying out measures which provide the greatest possible reduction in manual, unskilled and heavy physical labor.

The solution to the great and serious problems of accelerating scientific and technical progress requires the broadest participation of each labor collective, each specialist and worker in carrying this out. The tasks in the area of scientific and technical development as raised in the draft of the CPSU Central Committee should be fully reflected in the draft plans which are presently being worked out by the labor collectives for economic and social development during the 11th Five-Year Plan.

Prospects of Industrial Development

Moscow EKONOMICHESKAYA GAZETA in Russian No 2, Jan 81 p 2

[Unattributed article: "Industrial Development"]

[Text] Industry, and primarily its sectors which produce the means of production, play a crucial role in economic progress of society and in laying the material and technical base of communism. The development of such base sectors as power, metallurgy, machine building and metalworking, chemistry and petrochemistry, is the material basis for increasing the technical level of production, for meeting the needs of the national economy for fuel, energy, raw products and materials, machinery and equipment, and a most important condition for employing progressive production methods. An increase in the output of the means of production serves as a basis for expanded reproduction.

Industry is of great significance in the social progress of a society and in carrying out the program to increase the prosperity of the people. Here is produced a predominant share of material goods including food products, nonfood commodities,

cultural, domestic and household articles used for the purposes of personal and social consumption. Industry creates the material and economic prerequisites for profound changes in the most important sphere of human activity, in labor, as a result of the growth of the equipment-to-labor ratio and the introduction of new means of production.

Over the years of the Tenth Five-Year Plan, 717 billion rubles more industrial product were produced than in the Ninth Five-Year Plan. More than 1,200 major industrial enterprises were put into operation. There was a further growth of heavy industry, the foundation of the Soviet economy. The extraction of fuel, the generating of electric power and the production of ferrous and nonferrous metals increased. The output of consumer goods rose by 21 percent, including by 41 percent for cultural and household purposes.

The contribution of industry to carrying out the party's economic strategy in the 1980's will increase even more. As is stated in the Draft of the CPSU Central Committee to the 26th Party Congress "Basic Directions for the Economic and Social Development of the USSR for 1981-1985 and for the Period Up to 1990," the most important tasks of industry are the fuller satisfaction of the needs of the national economy for the means of production, and the needs of the population for consumer goods, the intensification of production, and a rise in product quality on the basis of the greatest possible use of achievements in scientific and technical progress. The production of industrial products during the years of the 11th Five-Year Plan will increase by 26-28 percent. The task has been posed of improving the structure of industrial production and achieving balance in the development of the extracting and manufacturing sectors.

The draft of the Basic Directions provides for an increase of 26-28 percent in the production of the means of production during the 11th Five-Year Plan. Particular attention is paid to the development of the sectors in the fuel and energy complex.

In electric power, the generating of electric power in 1985 must rise up to 1.55-1.6 trillion kilowatt hours. The development of nuclear power is to be carried out at a more rapid pace.

The increase in the production of electric power in the European USSR is to basically be obtained from nuclear and hydropower plants. Large hydroelectric plants are to be built on the rivers of Siberia, the Far East, Central Asia and Caucasus. The accelerated building of large thermopower plants will ensure efficient use of the cheap coals of the Ekibastuz and Kansk-Achinsk Basin, as well as the natural and casing-head gas from the Western Siberian deposits. In 1981, the generating of electric power should be 1.335 trillion kilowatt hours.

In the sectors of the fuel industry, along with increasing production, the task has been set of widely employing progressive extraction methods which will increase the recovery of coal, oil and gas from the ground. The increase in gas production will make it possible to reduce the use of oil as fuel, and to increase the level of its refining and broaden the output of end oil product. All of this will help to shift the economy to an energy-saving path of development.

In the oil industry, oil output should be brought in 1985 up to 620-645 million tons (along with the gas condensate). Some 85-90 percent of the oil is to be produced at

fully automated fields. The workers of the associations and enterprises in this sector should improve the technical and economic indicators for drilling work by the accelerated technical reequipping and further improving of their organization.

The major task confronting the gas industry is to carry out the program for the forced development of natural gas production. In 1985, the production volume should be 600-640 billion cubic meters. There are plans to build large-diameter gaslines, and to increase the capacity for the full processing of the oil-well and natural gas.

In the coal industry, coal mining in 1985 should rise to 770-800 million tons. The associations and enterprises should provide for the increase in the volume of coal mining and processing basically from an increase in labor productivity.

A large amount of work has been planned for the first year of the 11th Five-Year Plan. In 1981, the production of oil and gas condensate will be 610 million tons, for natural gas 458 billion cubic meters, and for coal 738 million tons.

In all areas of production, it is essential to achieve the rational use of fuel and energy resources. In the first year of the five-year plan, a savings of 41 million tons of conditional fuel units should be obtained. One of the most important factors in dependably meeting the growing needs of the national economy for fuel and energy is the use of secondary resources in production.

The draft of the Basic Directions has posed responsible tasks for the sectors producing structural materials. A fundamental improvement in quality and an increase in the output of effective types of metal product will become the main direction for the further development of ferrous metallurgy. The production of rolled metal in 1985 will rise to 117-120 million tons. The output of products of the chemical and petrochemical industry will increase by 30-33 percent. In the building materials, structural elements and parts industry, with an increase in the product volume of 17-19 percent, there will be predominant development of the production of articles which reduce metal intensiveness, the cost and labor intensiveness of production, the weight of the buildings and structures and increase insulating efficiency.

In the group of structural materials, more rapid growth has been set for the production of the economic types of rolled ferrous metals, aluminum, synthetic resins and plastics, composition materials and glued wooden structural elements. The share of progressive structural materials in their total output will rise by at least 1.5-fold. In 1981 alone, we will develop 140 new shapes of rolled metals, increase the output of cold-rolled sheet by 8 percent, and rolled products from low-alloyed steel by 21 percent. The production of ferrous merchant bar products will be 109.2 million tons.

For the purposes of accelerating technical progress in the entire national economy, the draft of the Basic Directions provide for more rapid development of machine building and metalworking, with their product output rising by 1.4-fold over the 5 years. In the production of the implements of labor, the basic factor for improving quality will be a rise in their technical level, reliability and durability.

In the machine building sectors, chief attention is to be paid to increasing the production of equipment, systems of machines and instruments which meet the needs of

the uniform technical policy under the conditions of the intensification of production. First of all this applies to the development of high efficient equipment, increasing the unit capacity and productivity of the produced machines and equipment, and the use of resource-saving production methods. This will strengthen the balanced development of the sectors which produce and consume the implements of labor. In machine building there must be an increase in the use factor of the metals, the number of machine tool operators must be stabilized, and the expenditures of manual labor reduced both in the basic shops and sections as well as particularly in the auxiliary ones.

Proceeding from the main task of the 11th Five-Year Plan, industrial production is to be more oriented to solving the problems of increasing the prosperity of the people. The draft of the Basic Directions provides for the more rapid development of consumer goods production. Over the 5 years their output is to be expanded by 27-29 percent. The increase in the production and the improvement in the quality of consumer goods are a primary task for all the industrial sectors and all enterprises and organizations, and a matter of special concern for the party and soviet bodies.

In light industry there is to be an increase in the product volume by 18-20 percent, and the output of goods in high demand is to be broadened. The task has been posed of significantly improving the quality, renewing and upgrading the assortment of cultural, domestic and household goods, the production of which is to rise by at least 1.4-fold. Specific quotas have been set for the heavy industry sectors for increasing the output of these goods. There will be accelerated development of the production of technically complex consumer durables which will be marked by newness of functional purpose and economicness, as well as by improved consumer and aesthetic properties.

The associations and enterprises and the local bodies should steadily seek out reserves for increasing the output of consumer goods and for widely utilizing wastes and local raw material resources.

The wider involvement of industry in ensuring the growth of national prosperity is also characterized by a rise of its sectors comprising the agroindustrial and food complex to a higher level. There will be increased output, and most importantly, improved quality of the mineral fertilizers, food supplements and plant protecting chemicals. The task has been set of increasing the productivity of tractors, motor vehicles, combines and other agricultural equipment. In accelerating the transition of agricultural production to an industrial basis and progressive production methods, industry will contribute to improving the supply of the public with food products, clothing, footwear and other commodities made from agricultural raw materials.

The collectives of the industrial associations and enterprises must increase the efficiency of industrial production on a basis of new management methods. It is essential to ensure a rise of 23-25 percent for labor productivity and approximately 1.3-fold for profits. In the draft of the Basic Directions particular attention has been paid to reducing the time for reaching designed capacity at newly completed enterprises and projects, increasing the shift coefficient for the most efficient machines and equipment, and more rapidly replacing obsolete equipment. For accelerating the opening up of production capacity and shortening its repayment

time, for balancing the newly created jobs with the labor resources, and for reducing the energy and material intensiveness of the produced products, the capital investments are to be channeled primarily into reconstruction and raising the technical level of existing enterprises.

The responsible tasks confronting the industrial workers should be fully reflected in the 1981 counterplans which are being elaborated at the associations and enterprises. The leading production collectives are defining additional opportunities in them for increasing the production volume and raising its efficiency on the basis of accelerating scientific and technical progress. In each collective it is essential to secure the unconditional fulfillment of the plan quotas for all items, and to have the prompt and precise observance of contractual obligations from the very first months of the new five-year plan.

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UKRAINIAN GOSPLAN OFFICIAL DISCUSSES REGIONAL SUPPLY

Moscow MATERIAL'NO-TEKHNICHESKOYE SNABZHENIYE in Russian No 10, Oct 80 pp 16-20

[Article by A. Emdin, Chief of the Political Division of Gosplan UkrSSR: "An Important Instrument for Strengthening Economic Relations"]

[Text] A CPSU Central Committee and USSR Council of Ministers decree pertaining to improvement of the economic mechanism authorized Gosplan USSR, jointly with Gossnab USSR and with the participation of the ministries and departments of USSR and the councils of ministers of the Union republics, to compile balance sheets of production and distribution of the most important types of output. This is an essentially new instrument for improving the interregional economic relations and the planning of material and technical supply and it would be hard to overestimate the importance of the instrument.

The "Methodological Directives for the Preparation of State Plans for Development of the USSR National Economy," issued in 1974 by Gosplan USSR, stipulated that the gosplans of the Union republics must compile accounting balance sheets of production and consumption of the most important types of industrial and agricultural output with a breakdown by territories. These balance sheets were to be prepared on the basis of the output products list determined by Gosplan USSR, Gossnab USSR and the gosplans of the Union republics. However, this products list was compiled only recently and the balance sheets which were drawn up in the republics were not examined by Gosplan USSR and not taken into consideration in its work. It should also be noted that the quality of the balance sheets prepared in the republic was low, primarily because of the lack of sufficient information. Thus, this work had to be begun again and it was first of all necessary to devise a unified system of methods, procedure and time limits for submitting the basic information pertaining to the compilation of territorial material balance sheets.

The territorial material balance sheets are extremely important for the solution of the problems of effective distribution of the productive forces along with, of course, the other factors which are given consideration when the decisions are made. It appears necessary in this connection to compile the balance sheets for the most important types of output at the stage of determination of the basic directions of the country's economic and social development for 10 and more years. Only in this context can provision be made at the proper time for the changes in the distribution of production and consumption of output and only in this context can the most economically sound final results be achieved.

If, for example, the procurement of timber is transferred to the country's eastern regions, then the sawmills and the primary processing of the wood should also be moved there because the shipment of round timber requires 40 percent more rolling stock than does the transport of the corresponding quantity of lumber. However, the pace of transferring the sawmills to the East is still extremely slow and the quantity of unprocessed wood being shipped enormous distances is not decreasing but rather increasing, with great costs being borne by the national economy.

An ever greater proportion of the coal extraction is assigned to the eastern regions and a considerable amount of this coal is sent in uncleaned form to the European part of the country, a practice which results in an unwarranted increase of 30-40 percent in the transport load and impairs the operations of the electric power stations. Cleaning the coal at the place of its extraction would yield a sizable economic effect.

Failure to carry out complete construction of production capacities in ferrous metallurgy is resulting in a yearly increase of transport from one metallurgical plant to another in the case of pig iron, steel ingots, slabs and blooms for reprocessing. This although 10-15 years ago it was assumed that this transport should be curtailed and that it would be reduced to a minimum.

Solution of the problems entailed in improving the distribution of production takes a long time and hence the basic directions of the country's economic and social development should include provision for the preparation of balance sheets for the most important types of output for the final years of the five-year plan with respect to not only the country as a whole but also the country's regions.

The USSR Gosplan council for the study of the productive forces is compiling as preplan materials general schemes for distribution of the country's productive forces; these schemes become part of the system of territorial planning. It would be desirable that for purposes of substantiating the proposals for the distribution of industry over the long term, this council would also compile preliminary territorial balance sheets for materials.

As stipulated in the USSR Gosplan and Council of Ministers decree on improvement of the economic mechanism, Gosplan USSR must work out control figures for the basic indicators and norms for the five-year plan and the separate years with a breakdown by ministries, departments and Union republics. It also seems necessary to provide for preliminary limits of consumption of the most important types of material resources, these to serve as control figures.

In the five-year plan drafts the ministries, departments and councils of ministers of the Union republics must specify the requirements for materials as established by the control figures of Gosplan USSR. These refined five-year plan requirements must be distributed by regions. The past work of compiling plans of material and technical supply indicates that in their requisitions for the quantity of materials the ministries, departments and Union republics are going considerably beyond the funds allotted to them. It should not be thought that the requisitions are always unduly inflated, although this does happen frequently. Whereas, for example, the requisitions for petroleum asphalt come to one and a half to twice the allotted funds, this reflects the actual requirements because the shortage of petroleum asphalt is resulting in the building of a considerable number of the roads with

substandard covering. Also, the existing roads are not being maintained in satisfactory condition when the financial resources and capacities of the road-construction organizations would permit building roads with asphalt surfaces and repairing them on time. However, with the current status of the raw material resources it does not now appear possible to fully satisfy the petroleum asphalt requirements.

If the ministries, departments and Union republics submitted data on territorial material resources requirements arrived at without regard for the actual potentialities, then, when drawing up the territorial balance sheets, it would be impossible to correct the indicators for the various regions because with the limited resources some regions would have priority over others in the satisfaction of requirements. And without the ministries, departments and Union republics--the possessors of capital--it is not possible to determine this priority. A territorial material balance sheet drawn up without regard for the actual resources cannot contribute anything to solution of the problems of distribution of new production capacities and improvement of the interregional transport and economic relations.

This problem has one other extremely important aspect. We cannot indefinitely maintain high rates of increase of production of metal, cement, commercial wood and other materials. It is far more advantageous for the national economy to develop in the metallurgical industry a "fourth reduction" and to substantially increase the production of effective types of rolled metal. On this basis, of course, with improvement of the designs of the machines and mechanisms in production and the production technology for them, we can reduce the amount of metal consumed for the production. Stepping up the grade of the cement and providing superior-quality, especially prepared inert materials for the production of cement, requires far less outlays than further growth of the production of cement. Increased production of paper and cardboard reduces the need for lumber and yields a greater final result. All these measures for improvement of the production structure as envisaged by Gosplan USSR both for the stage of preparation of the basic directions of the country's economic and social development and for the stage of compilation of the five-year plan, cannot be taken into consideration either by the enterprises and construction project consumers of these materials or by the ministries of which they are a part, because the measures are simply unknown at this stage.

In light of all these circumstances, it is essential that the USSR ministries and departments and the Union republics obtain from Gosplan USSR, as part of the control figures, preliminary limits of consumption of materials and that on the basis of the actual limits they compile data on their requirements for material resources.

To provide adequate substantiation for the balance sheets, both those for the country as a whole and those broken down by territories, it is necessary that the possessors of capital who will determine the materials required for the five-year plan consume an overall amount equivalent to 80-85 percent of the total quantity of this material.

The compilation of the territorial material balance sheets must be carried out simultaneously with the production and construction plans and the plans for territorial distribution of the productive forces because these balance sheets must

be considered in the preparation of all the sections of the plan. The balance sheets compiled at this stage of the preparation of the plan of economic development will obviously differ to some extent from the balance sheets and distribution plans prepared in the final stage of the planning when the various sections of the plan are being coordinated. However, the purposes for which the territorial balance sheets are drawn up do not require the meticulousness which is indispensable in the compilation of the material and technical supply plans, which consist of the balance sheets and the distribution plans.

A very important question concerns the kind of regions for which the territorial material balance sheets should be compiled. Various points of view have been put forth in this regard. Some economists suggest that they be drawn up with respect to the Union republics while others feel it necessary to draw up the balance sheets for the oblasts. The balance sheet for the RSFSR, which extends over many thousands of kilometers, cannot offer any help in improving the interregional economic relations and, on the other hand, there is not always a need for the compilation of a balance sheet broken down by oblasts.

For example, there is no need to compile a motor vehicle gasoline balance sheet for Rovenskaya Oblast in Ukrainian SSR, where there are no oil refineries and the demand for the gasoline is clearly a great deal less than a single modern petroleum refining installation can produce. It is quite a different story with the large economic region. For the economic regions the compilation of balance sheets for nearly all the most important materials is a matter of great importance for the solution of problems relating to improvement of the interregional economic relations. There is need for the drawing up of a motor vehicle gasoline balance sheet for the southwestern economic region, which includes Rovenskaya Oblast and where oil refineries exist. This economic region has extensive relations with other economic regions, obtaining various oil products from some and delivering such products to others. As to which of these interregional links are desirable and whether there is need for the construction of another oil refinery in the southwestern economic region--all these questions must be resolved with the help of a territorial balance sheet along with the use, of course, of other economic and technical data.

In a number of other instances, however, it is necessary to prepare balance sheets for the oblasts, as for example, those for local building materials and some types of agricultural output.

Thus, the question of what region requires the drawing up of a material balance sheet should be examined and decided for each kind of material but, as a rule, such balance sheets must be compiled for large economic regions.

In planning the establishment and development of territorial and industrial complexes it would have been desirable to prepare material balance sheets which include these territories, provided they are not listed in the territory of an economic region.

On what products list should the drawing up of the territorial balance sheets be based? A very simple answer suggests itself--on all the types of centralized planned output except that which is produced in a limited number of enterprises

in the country, output which particularly comes under the heading of equipment (hydroturbines, for example, or large steam boilers) and some materials (for example, titanium).

However, such a solution of the problem would be unrealistic, for a foreseeable period at any rate. This is due primarily to the fact that putting territorial material balance sheets into operation requires specific experience and it will be necessary to organize an extensive flow of information and to insure the accuracy of this information and the possibility of checking it.

In the next few years we believe there will have to be a limitation on the most distinctly mass types of output, the consumption of which entails a great deal of goods traffic. For example, for materials of a production and technical nature it is desirable to limit the balance sheets for the economic regions to the following product list output both at the stage of the working out of the basic directions of the social and economic development for a 10-year period and when preparing the five-year plan: boiler and furnace fuel, coal, natural gas, heating mazut, motor gasoline, diesel fuel, iron ore, rolled ferrous metals, steel pipe, copper, zinc, lead, aluminum, commercial wood, lumber, cement, roofing materials, mineral fertilizers, sulfuric acid and soda ash.

Of course, the aforementioned products list has many deficiencies chiefly because it is very extensive and in the estimates it is necessary in a number of cases to give it in detail. The products list will have to be expanded in the future; we will have to include other materials which are consumed in great quantities and we will have to single out within these groups of items various types of output (for example, the most important assortment types of rolled ferrous metal and steel pipe) but for the beginning this rather strict limitation is necessary.

In order that the material balance sheets may include all the resources and determine their economic use, it is necessary in particular that they also take into account the secondary resources. Whereas the fuel and energy balance sheet or the ferrous metal balance sheets have for a long time allowed for the secondary resources, thus helping to provide for efficient utilisation of these resources, the balance sheet of rolled ferrous metals on the other hand does not allow for the commercial waste products and the resources of these are distributed by Gossnab USSR without regard for the rolled ferrous metal distribution carried out by Gosplan USSR. As a result, a substantial portion of the wastes which could have been successfully used in lieu of the full-value rolled metal is sent instead for remelting. This is especially true of the wastes which are generated in machine building.

What information are the territorial material balance sheets to be based on and who is to compile them? A number of economists suggest that we organize a pool of the basic economic information from all the enterprises and organizations in a particular territory. We have already shown above that the information on the long-term material requirements broken down by regions can be used effectively only if the information reflects the real potentialities of the economic structure in the planned stage. If the information came in from every enterprise, sovkhoz and kolkhoz, it is safe to say that it could be used neither for the solution of problems involving the distribution of production capacities nor for improvement

of the interregional transport and economic links because the requirements determined in light of such information would bear an abstract character and would not harmonize with the actual resources which could not be known at this stage, to say nothing of the fact that, as experience shows, the requisitions from the enterprises are frequently unduly inflated.

Both at the stage of working out the basic directions of the country's economic and social development and at the stage of drawing up the five-year plan the requirements for the most important types of materials must be estimated for the country as a whole and for the economic regions by the USSR ministries and departments and the gosplans of the Union republics; these government organs will, of course, enlist for this work the associations, enterprises and organizations under their jurisdiction. The USSR ministries and departments and the Union republic gosplans must also submit data on the actual consumption of materials during the base years. It is obviously also necessary to submit the accounting data for the years of the current five-year plan.

As a rule, the planning organs already possess the information on output production broken down be territories but in some cases they may be in need of this data and then it may also be submitted by the USSR ministries and departments and the Union republic gosplans.

Finally, for the compilation of long-term territorial material balance sheets information is required on the interregional economic links which have been formed for the deliveries of output. This information must be submitted to the Union main administrations of supply and sales and, in addition to the interregional links, it must also cover export and import with a breakdown by economic regions. In the instances where this data is compiled by the TsSU [Central Statistical Administration] USSR (a subject we will discuss below) there is, of course, no need to duplicate it for the Union main administrations of supply and sales.

For the compilation of current (yearly) material balance sheets with a regional breakdown we find quite sufficient the information which now comes into the Union and republic main administrations of supply and sales in the form of consumer fund distributions and supplier enterprise production plans.

It seems to us desirable that all the information concerning the economic regions' resources and output requirements and also concerning the interrepublic links for deliveries of this output be sent to Gosplan USSR with a copy to the gosplans of the appropriate Union republics. The gosplans of the Union republics are also required to send to Gosplan USSR the information pertaining to the republic economy and the nonindustrial Union-republic ministries with a breakdown by economic regions. All this data must be compiled concurrently by Gosplan USSR and the gosplans of the Union republics. The latter submit their suggestions for improvement of the interregional economic relations, which suggestions Gosplan USSR can take into consideration when shaping in final form the basic directions of the economic and social development and the five-year plans. To have the long-range territorial material balance sheets include the subjects of deliveries of output, Gosplan USSR would have to enlist the services of the Union main administrations of supply and sales, which have a great deal of experience in this field.

Both in the basic directions of the country's economic and social development over the 10-year period and in the five-year plans Gosplan USSR will compile balance sheets of the most important types of output and the territorial material balance sheets will, in essence, represent a collated material balance sheet broken down by economic regions. This kind of organization of the work enables us to perform on a level of high quality and makes it possible to implement in the production and material and technical supply plans the decisions taken for optimization of the interregional economic relations.

Preparation of the yearly material balance sheets for the Union republics and the economic regions of RSFSR is best assigned to the Union main administrations of supply and sales of Gossnab USSR and those for the economic regions of Ukrainian SSR to the main administrations of supply and sales of UkrSSR. The preparation of the yearly petroleum product balance sheet for the economic regions should, in our opinion, be entrusted to the Goskomnefteprodukt [State Committees for Petroleum Products] of RSFSR and UkrSSR.

For local building materials both the long-term and the current balance sheets are compiled by the oblast planning committees while the planning committees of the Union republics determine interoblast exchange.

There is no need for Gosplan USSR to draw up the yearly territorial material balance sheets because they cannot be used for deciding questions pertaining to improvement of production distribution and output consumption. However, optimization of the interregional economic links for deliveries of output, a matter which is of paramount importance, particularly now when transport problems have become exceptionally acute, can also be accomplished to a considerable degree in the yearly plans. And the best way of preparing for decisions on these questions is through the territorial balance sheets. At present when Gosplan USSR and Gossnab USSR draw up the yearly plans for the country's economic and social development, they also prepare measures for the rationalization of shipments but these plans encompass only a comparatively small portion of the questions.

Productive work, which however requires further development, is being done by the Soyuzglavneft [Main Administration for Interrepublic Deliveries of Petroleum Products], where every year they draw up the plans for deliveries of these products which represent the balances for the Union republics. These balances, which are based on the plans for the production and distribution of output adjusted in light of the schemes for normal goods traffic, should have been drawn up by all the Union main administrations of supply and sales under Gossnab USSR for the output the deliveries of which entail mass goods traffic and complex interregional links. The task of improving the interregional transport and economic links cannot be accomplished without a comprehensive use of the balance sheets for the economic regions. It seems to us desirable that the yearly consolidated balance sheet for interregional deliveries of output should be determined by the indicator for average distance of the shipments. And reducing the extent of these distances requires the introduction of economic incentive programs for the Union main administrations of supply and sales.

The idea of using EVM [electronic computers] for improving the interregional economic links for deliveries of output was theoretically resolved more than 20 years ago but up to now the pace at which this effective method is being put into operation has been extremely slow. One would have to believe that important economic results can be obtained by incorporating the preparation of territorial material balance sheets in the system as a component of the plan for linking the consumers with the suppliers, by introducing EVM for this purpose, and by bolstering the workers of the Gossnab USSR supply and sales organizations with substantial economic incentives for reducing the distance of the goods shipments.

The TsSU USSR issues yearly reports on the distribution of the shipments into and out of the regions of some types of industrial output as per form 10-ps. This material is of great value for analysis of the interregional transport and economic links.

Beginning in 1979 the TsSU organs began to prepare reports on the balances and expenditures of raw materials and materials in the production and operational activity and in the capital construction--reports on form 1-sn and 2-sn (territory) with a breakdown by oblasts. This data could have been used very effectively if it had included every industry and not just the industry sectors now listed on these forms.

The products list which is the basis for the drawing up of the reports on forms 10-ps, 1-sn and 2-sn (territory) needs to be reviewed; it should jibe with the products list on which the territorial material balance sheets will be based. Incidentally, it should be noted the products list on forms 1-sn and 2-sn (territory) are not in complete harmony. For example, whereas form 1-sn provides for commercial wood--the total including round timber, form 2-sn only covers round timber and hence it is not possible to derive the overall quantity of commercial wood.

It would be desirable in the near future to have Gosplan USSR, Gossnab USSR and TsSU USSR review and resolve the matter of the products list which the organs of the TsSU USSR are to use as a basis for compiling the yearly reports on forms 10-ps, 1-sn and 2-sn (territory).

The solution of the aforementioned problems will help in obtaining an improvement in the territorial planning, a fuller accounting of the resources of the country's regions in the plans, and a rational distribution of the productive forces.

7962
CSO: 1820

U.S., USSR ECONOMIC DEVELOPMENT INDICATORS COMPARED

Moscow VESTNIK STATISTIKI in Russian No 12, Dec 80 pp 37-44

/Article by V. Martynov: "The Index Method of Comparing the Levels of USSR and U.S. Economic Development"/

/Text/ The advantage of the planned management of the socialist economy over the spontaneously developing "market economy" of capitalist countries can be revealed only as a result of regularly made international comparisons. The standardization of the content of the value indicators being compared and their conversion from the national currency into a comparable currency are carried out in the process of making the comparisons. Soviet international statistics is based on a system of overall economic indicators, which define concretely in the form of figures the most important principles of the Marxist-Leninist theory of the reproduction of the gross national product.

The methods of converting the official statistical data of the system of national accounts of the United States according to the report balance of the USSR are essentially recognized by official agencies of the United States.

However, according to the claim of bourgeois statisticians, not the national income, but the gross national product is the most acceptable indicator for the comparison of the levels and rates of development of the economy of countries with a different socio-economic system. By means of the indicator "the gross national product," the methodology of whose calculation is based on the principles of vulgar political economy, American statisticians make all international comparisons, including economic comparisons of the USSR and the United States.

We will not broach the questions of the economic content of the statistical indicators which are the basis for international comparisons. Let us dwell only on the methods of creating international physical indices and international price indices. These questions of the theory of statistics for the present are still the least elaborated and are arousing the greatest debate among the experienced workers and scientists who are engaged in international socio-economic comparisons.

The comparison of the levels of economic development of the USSR and the United States, as is known, can be accomplished by means of both the (Laspares) and the (Paasche) index. In the former case the aggregation is carried out according to the scales of the United States, while in the latter it is carried out according to

the scale of the Soviet Union. If we designate the physical indicators of the production and consumption of goods and services of the USSR by q_s and the monetary expression of their value by p_s, while we express the corresponding indicators of the United States by the symbols q_u and p_u, the international aggregate physical index of (Laspares) and (Paasche) can be expressed in the following manner:

Economic level of the USSR as a percentage of the United States in U.S. prices

$$\frac{\Sigma q_s p_u}{\Sigma q_u p_u}$$

Economic level of the USSR as a percentage of the United States in USSR prices

$$\frac{\Sigma q_s p_s}{\Sigma q_u p_s}$$

The material assets produced in the USSR and the United States have approximately the same use purpose. But the expenditures of socially necessary labor in their creation are different owing to the peculiarities of the historical development of production, its specialization and cooperation, the degree of involvement of the country in the international division of labor and the uniqueness of natural conditions.

An inversely proportional relation is observed between the amount of the domestic output of one product or another and the amount of the national socially necessary labor, which was expended in the process of making it. Precisely this explains the fact that the index constructed according to the scale of the country of the comparer (the (Laspares) index) in its value is greater than the index calculated according to the national scale (the (Paasche) index).

Among economists of our country and abroad the opinion is widespread that the (Laspares) index overstates the results of international comparisons, while the (Paasche) index understates them. Hence the conclusion is drawn that it is most expedient to define the ratios of the levels of economic development of countries with the same and a different socio-economic system as the geometric mean index of (Laspares) and (Paasche). American statisticians also adhere to this method of calculation when they compare the amounts of the gross national product of the USSR and the United States. Here they admit that "the geometric mean is convenient practically for international comparisons, but theoretically it is poorly substantiated."[1]

Such an assessment of the "geometric mean method of international comparisons" is in essence a criticism of I. Fisher's ideal index, the theoretical and practical untenability of which V. N. Starovskiy demonstrated with complete persuasiveness back in the early 1930's.

The practical work experience of the Administration of Statistics of Foreign Countries of the USSR Central Statistical Administration showed that the most reliable results of international comparisons can be obtained not by formal mathematical calculating operations, but with the comprehensive use of all the properties of the index function.

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1. "Soviet Economy in a Time of Change," Washington, 1979, p 372.

As is known, the value indicators expressed in the national currency, which are calculated according to a uniform methodology for the countries being compared, are the basis for international comparisons.

The ratio of the value indicators in the national currency cannot in itself perform the role of an international index. But the function of this index, let us call it the index of national value amounts, is of great importance in the practice of international comparisons.

The function of the index of national value amounts in its most abstract form has the following form:

$$Y = f(x; \gamma),$$

where x is a variable which characterizes the ratio of the physical volume of goods and services of the countries being compared; γ is a variable which characterizes the ratio of the level of prices of the countries being compared.

Since the ratio of the physical volumes of production and the levels of prices when making international comparisons can be determined by means of both the (Laspares) and (Paasche) indices, the variables x and γ are two-digit numbers. The two-digit nature of the variables in their functional relationship can be expressed in the form of algebraic notation:

$$\frac{\Sigma q_1 p_1}{\Sigma q_0 p_0} = \frac{\Sigma q_1 p_0}{\Sigma q_0 p_0} \cdot \frac{\Sigma p_1 q_1}{\Sigma p_0 q_1} = \frac{\Sigma q_1 p_1}{\Sigma q_0 p_1} \cdot \frac{\Sigma p_1 q_0}{\Sigma p_0 q_0}.$$

From this equation it is evident that the index of the national value amounts is the product in the former instance of the (Laspares) physical index and the (Paasche) price index and in the latter case of the (Paasche) physical index and the (Laspares) price index.

In international comparisons the data of each country can be used in the form of comparable values or comparers. Thus, in the quantitative characterization of the course of the economic competition of the USSR and the United States the international indices can be constructed according to the scheme I_u = USSR/United States and I_s = United States/USSR.

Owing to this the observance of the following condition is of especially great practical importance: $I_u = 1/I_s$ and, vice versa, $I_s = 1/I_u$. The function of the national value amounts meets these requirements not in the case of any combinations of the variants, but only in the case of certain combinations which can be expressed algebraically as two systems of equations.

System of equations No 1 is:

$$\begin{cases} \dfrac{\Sigma q_s p_s}{\Sigma q_u p_u} = \dfrac{\Sigma q_s p_u}{\Sigma q_u p_u} \cdot \dfrac{\Sigma p_s q_s}{\Sigma p_u q_s} \\ \dfrac{\Sigma q_u p_u}{\Sigma q_s p_s} = \dfrac{\Sigma q_u p_u}{\Sigma q_s p_u} \cdot \dfrac{\Sigma p_u q_s}{\Sigma p_s q_s}, \end{cases}$$

where p_u and q_u are the prices and physical volumes of production and consumption of the United States; p_s and q_s are the prices and physical volumes of production and consumption of the USSR.

Here the (Laspares) physical index $\Sigma q_s p_u / \Sigma q_u p_u$ and the (Paasche) physical index $\Sigma q_u p_u / \Sigma q_s p_u$ are invertible. This is easy to prove:

$$1 : \frac{\Sigma q_s p_u}{\Sigma q_u p_u} = \frac{\Sigma q_u p_u}{\Sigma q_s p_u} \quad \text{and, vice versa,}$$

$$1 : \frac{\Sigma q_u p_u}{\Sigma q_s p_u} = \frac{\Sigma q_s p_u}{\Sigma q_u p_u} .$$

The mutual invertibility of the cofactors--the physical indices and the price indices--also governs the invertibility of the products--the indices of the national value amounts:

$$\frac{\Sigma q_s p_s}{\Sigma q_u p_u} \quad \text{and} \quad \frac{\Sigma q_u p_u}{\Sigma q_s p_s} .$$

The invertibility of the overall index is also achieved in the case of the value of the variants which are calculated according to the indices, the relationship between which is expressed algebraically by the following system of equations.

System of equations No 2 is:

$$\begin{cases} \dfrac{\Sigma q_s p_s}{\Sigma q_u p_u} = \dfrac{\Sigma q_s p_s}{\Sigma q_u p_s} \cdot \dfrac{\Sigma p_s q_u}{\Sigma p_u q_u} \\ \dfrac{\Sigma q_u p_u}{\Sigma q_s p_s} = \dfrac{\Sigma q_u p_s}{\Sigma q_s p_s} \cdot \dfrac{\Sigma p_u q_u}{\Sigma p_s q_u} \end{cases} .$$

Each cofactor of one of these equations is the inverse of the corresponding cofactor of the other equation.

The revelation of the concept "direct" or "inverse" index function is not a theoretical investigation. This problem, which is connected with the choice of the "base" country, the statistical data of which perform the role of a unique comparer, is of great practical importance in international statistics.

Among foreign economists the opinion is widespread that the opportunities for bilateral and multilateral comparisons through a base country are limited owing to the fact that it is ostensibly difficult to give preference to a single currency. Therefore proposals are made to perform such statistical work by means of a collective currency, the "parity" of which is determined by a strictly accounting method. It is our belief that international comparisons cannot be made on the basis of prices which are calculated according to abstract mathematical models. The monetary comparer in international statistics should reflect the ratio of actually existing prices.

The USSR Central Statistical Administration compares the levels of economic development of the USSR and the United States by converting the Soviet value indicators from rubles into dollars. This is done so that in terms of prices of the United States it would be possible to compare the statistical indicators of the USSR Central Statistical Administration with the value aggregates not only of the United States, but also of other capitalist countries, which are identical in their economic content. In other words, in characterizing quantitatively the economic competition of the socialist and capitalist economic systems the United States performs the role of the "base country."

The comparison according to the scheme USSR/United States is a direct comparison, while the comparison according to the scheme United States/USSR is an inverse comparison. The direct and inverse comparisons of the standardized economic indicators of the USSR and the United States are made on the basis of the prices of a set of representative goods. This means that in system of equations No 1 the (Paasche) aggregate price index when used in practice has the form:

$$\frac{\Sigma p_s q_s}{\Sigma p_u q_s} = \frac{\Sigma q_s p_s}{\Sigma \left(\frac{p_u}{p_s} \cdot q_s p_s\right)} = \frac{\Sigma q_s p_s \cdot 1/\Sigma q_s p_s}{\Sigma \left(\frac{p_u}{p_s} \cdot q_s p_s\right) 1/\Sigma q_s p_s} = \frac{1}{\Sigma \left(\frac{p_u}{p_s} \cdot \frac{q_s p_s}{\Sigma q_s p_s}\right)}.$$

while the (Laspares) aggregate price index is transformed into the following form:

$$\frac{\Sigma p_u q_s}{\Sigma p_s q_s} = \frac{\Sigma \left(\frac{p_u}{p_s} \cdot q_s p_s\right)}{\Sigma q_s p_s} = \frac{\Sigma \left(\frac{p_u}{p_s} q_s p_s\right) 1/\Sigma q_s p_s}{\Sigma q_s p_s \cdot 1/\Sigma q_s p_s} = \Sigma \left(\frac{p_u}{p_s} \cdot \frac{q_s p_s}{\Sigma q_s p_s}\right).$$

Accordingly the aggregate price indices in system of equations No 2 are changed in the following manner:

$$\frac{\Sigma p_s q_u}{\Sigma p_u q_u} = \Sigma \left(\frac{p_s}{p_u} \cdot \frac{q_u p_u}{\Sigma q_u p_u}\right)$$

$$\frac{\Sigma p_u q_u}{\Sigma p_s q_u} = \frac{1}{\Sigma \left(\frac{p_s}{p_u} \cdot \frac{q_u p_u}{\Sigma q_u p_u}\right)}.$$

The ratios $q_s p_s : \Sigma q_s p_s$ and $q_u p_u : \Sigma q_u p_u$ characterize the proportion of the primary conversion group in the total value of the value indicator, which is expressed in the former case in rubles and in the latter case in dollars. p_u/p_s and p_s/p_u are the average group price indices. They are invertible, that is,

$$1 : \frac{p_u}{p_s} = \frac{p_s}{p_u} \quad \text{and} \quad 1 : \frac{p_s}{p_u} = \frac{p_u}{p_s}.$$

If the value of p_s (the USSR average price) and p_u (the U.S. average price) is known, the question of the direct and inverse value of the group price index is solved not mathematically, but logically. We will assume that the direct value of the group prices is the ratio p_s/p_u, while the inverse value is p_u/p_s.

However, the national average prices, no matter how detailed they may be, can be used in international comparisons with very great caution, since the quality and use value of the products and items of similar commodity groups, as a rule, differ greatly from each other.

The work experience of the USSR Central Statistical Administration has shown that the most precise results of international socio-economic comparisons can be obtained only on the basis of the individual prices of representative goods. For example, the Administration of Statistics of Foreign Countries of the USSR Central Statistical Administration compares the volumes of the commodity turnover of retail trade of the USSR and the United States, as one of the forms of the receipt of material wealth for the ultimate consumption of the population and the institutions which serve the population, on the basis of the individual prices of 165 representative goods of 57 primary conversion commodity groups of the Soviet Union and the United States. The number of representative goods is different for each primary conversion group. Thus, there are two of them for bread and bakery goods, only one for flour, while there are six for sausages, two for silk fabrics, eight for clothing and underwear and so on.

The availability of information on the prices of goods, which are similar or identical in their consumer properties, makes it possible to calculate individual price indices. Each of them characterizes the ratio of the price of the Soviet Union to the price of the United States (i_s) or, vice versa, the ratio of the price of the United States to the price of the USSR (i_u).

It is impossible to weight the individual indices, since the choice of representative goods is a unique sampling with an identical degree of probability of the appearance of each individual attribute. The simple average of the individual indices is conditionally regarded as the group index. Here the invertibility of the group index is achieved, if it is the geometric mean, which is calculated according to the formula:

$$I = \sqrt[n]{i^1 \cdot i^2 \cdot i^3 \ldots i^{n-1} \cdot i^n}$$, where i can be both i_s and i_u.

The group indices like $I_s = \sqrt[n]{\Pi i_s} = p_s/p_u$ are united into the overall price index V_s according to the scale of the United States, while the group indices like $I_u = \sqrt[n]{\Pi i_u} = p_u/p_s$ are united according to the scale of the USSR. In practice this means that two systems of scales have to be used when ascertaining the monetary conversion coefficient. Thus, the real parity of the ruble to the dollar V_s can be determined by weighting the group price indices according to the indicators of the structure of both the Soviet Union and the United States. In the former case it is

$$\frac{\Sigma p_s q_s}{\Sigma p_u q_s} = 1 : \Sigma \left(\frac{p_u}{p_s} \cdot \frac{q_s p_s}{\Sigma q_s p_s} \right)$$, and in the latter it is $$\frac{\Sigma p_s q_u}{\Sigma p_u q_u} = \Sigma \left(\frac{p_s}{p_u} \cdot \frac{q_u p_u}{\Sigma q_u p_u} \right).$$

If we designate $q_s p_s / \Sigma q_s p_s$ by W_s, $q_u p_u / \Sigma q_u p_u$ as W_u, and $p_s : p_u$ in the form I_s and $p_u : p_s$ in the form I_u, then V_s can be expressed in the former variant of the calculation as $V_s' = 1/\Sigma I_u W_s$ and in the latter as $V_s'' = \Sigma I_s W_u$.

In their economic content V_s' and V_s'' are equivalent. But their numerical value is different. It depends to a considerable extent on the choice of scales. The experience of international comparisons shows that the ratio of the ruble to the

dollar, which is calculated according to the pattern of consumption of goods and services of the USSR, is always less than the value of the same indicator, which, however, has been calculated according to the pattern of consumption of goods and services of the United States.

The variation of the numerical value of the currency coefficients, which is governed by the existence of two systems of the aggregation of group price indices which are identical in their economic meaning, does not make it possible to characterize the ratio of the levels of economic development by a simple relative value. The end results of the direct international comparisons, which characterize the course of the economic competition of the USSR and the United States, can be expressed mathematically by two formulas:

$$\frac{\Sigma q_s p_u}{\Sigma q_u p_u} = \frac{\Sigma q_u p_s}{\Sigma q_u p_u} : \frac{\Sigma p_s q_s}{\Sigma p_u q_s} \qquad (1)$$

$$\frac{\Sigma q_u p_s}{\Sigma q_u p_u} = \frac{\Sigma q_s p_s}{\Sigma q_u p_u} : \frac{\Sigma p_s q_u}{\Sigma p_u q_u}. \qquad (2)$$

The difference between these formulas is that the physical index in the former of them (the (Laspares) index) is the quotient from the division of the index of the national value amount by the (Paasche) international price index, while in the latter formula the (Paasche) physical index is the quotient from the division of the same direct index of the national value amount by the (Laspares) price index.

The experience of international comparisons has convincingly proven that the ratio of the ruble to the dollar, which is calculated according to the pattern of the USSR (the (Paasche) price index), is always characterized by a smaller relative value than the same ratio which is calculated according to the pattern of the United States (the (Laspares) price index).

However, if $\Sigma p_s q_s / \Sigma p_u q_s < \Sigma p_s q_u / \Sigma p_u q_u$, from formulas 1 and 2 it follows that $\Sigma q_s p_u / \Sigma q_u p_u > \Sigma q_s p_s / \Sigma q_u p_s$. This inequality expresses the fact well known to experienced statisticians that the comparison of the levels of economic development of the USSR and the United States, which is made according to the prices of the United States, yields higher results than the calculations according to the prices of the USSR.

International comparative statistics so far has used indices, the methods of construction of which have been adapted for the needs of national statistical organs and primarily for the establishment of the dynamics of the level of prices, the change in the physical volume of products and services and the amount of income created in the process of their production and consumption.

In the statistical study of the trends of development of the economy of one country or another the aggregation of economic phenomena, which are not being directly compared, is accomplished according to the data of either a base period or a period under review. Precisely this was responsible for the extensive use in national statistical practice of the (Laspares) index and the (Paasche) index. The former, as is known, is constructed on the basis of base scales, while the latter is constructed according to the scales of the period under review.

In constructing territorial indices the problem of weighting is solved differently. In national regional indexology the scales are determined according to the indicators of the structure of the entire economy of the country or the integrated economy of the regions being studied.

In international comparisons of the levels of economic development, apparently, it is also legitimate to use as scales the indicators of the structure of the economy not of one country, but of two countries simultaneously. This can be achieved, in our opinion, by calculating the average relative indicators of the structure of the economy of the countries being compared. Such an "averaged" or "standardized" system of scales is of a purely accounting nature. But this method, which is dictated by the goals of indexing, is fully justified economically, since it makes it possible to calculate the most correct exchange rates and, consequently, the international physical indices.

As is known, the system of scales of the Soviet Union $q_s p_s / \Sigma q_s p_s$ is a vector of relative indicators, which can be written as:

$$\left|\begin{array}{c} W_s^1 \\ W_s^2 \\ \vdots \\ W_s^n \end{array}\right| \quad \Sigma W_s = 100.$$

The scales of the United States $q_u p_u / \Sigma q_u p_u$, which are used in constructing international indices, are also a vector of relative indicators, which can be represented in the following manner:

$$\left|\begin{array}{c} W_u^1 \\ W_u^2 \\ \vdots \\ W_u^n \end{array}\right| \quad \Sigma W_u = 100.$$

Let us designate $1/2\ (W_s + W_u) = d$, then the vector of standardized scales will assume the form:

$$\left|\begin{array}{c} d_1 \\ d_2 \\ \vdots \\ d_n \end{array}\right| \quad \Sigma d = 100.$$

When using the standard scales in international comparisons the price indices, which characterize the parity of currencies and, in particular, the ratio of the ruble to the dollar, can be written as:

(Laspares) price index $\frac{\Sigma p_s q_u}{\Sigma p_u q} = \Sigma\left(\frac{p_s}{p_u} \cdot \frac{q_u p_u}{\Sigma q_u p_u}\right) = \Sigma\left(\frac{p_s}{p_u} \cdot W_u\right) = \Sigma\left(\frac{p_s}{p_u} \cdot d\right)$ on the condition that $W_u = d$.

(Paasche) price index $\frac{\Sigma p_s q_s}{\Sigma p_u q_s} = \frac{1}{\Sigma\left(\frac{p_u}{p_s} \cdot \frac{q_s p_s}{\Sigma q_s p_s}\right)} = \frac{1}{\Sigma\left(\frac{p_u}{p_s} \cdot W_s\right)} = \frac{1}{\Sigma\left(\frac{p_u}{p_s} \cdot d\right)}$ on the condition that $W_s = d$.

Owing to the properti... of averages $\Sigma\left(\frac{p_s}{p_u} \cdot d\right)$ does not equal $\frac{1}{\Sigma\left(\frac{p_u}{p_s} \cdot d\right)}$. Therefore, in the practi... f international comparisons it is more convenient to define the parity of the ru... and the dollar on the basis of the following equation:

$$\Sigma\left(\frac{p_s}{p_u} \cdot d\right) = \Sigma\left[\left(1 : \frac{p_u}{p_s}\right) d\right] = \frac{\Sigma p_s \bar{q}}{\Sigma p_u \bar{q}}.$$

The currency conversion coefficient $\Sigma p_s \bar{q} : \Sigma p_u q$ is in essence the (Laspares) international price index, in which the scales of the United States are replaced by standardized scales.

The (Paasche) international price index $\Sigma p_s q_s : \Sigma p_u q_s$ after the replacement in it of the scales of the United States by standardized scales in its numerical value approximates the value of the (Laspares) index, which is calculated according to the same scales, so that the ratio between them is expressed by a coefficient which is equal to one. The changeover from the physical index, which is calculated according to USSR prices, to the same index, which, however, is calculated according to U.S. prices, can be accomplished by means of the following equation:

$$\frac{\Sigma q_s p_s}{\Sigma q_u p_s} : \left(\frac{\Sigma p_s q_s}{\Sigma p_u q_s} \Big/ \frac{\Sigma p_s q_u}{\Sigma p_u q_u}\right) = \frac{\Sigma q_s p_u}{\Sigma q_u p_u}.$$

If $\Sigma p_s q_s / \Sigma p_u q_s : \Sigma p_s q_u / \Sigma p_u q_u = 1$, then $\Sigma q_s p_s / \Sigma q_u p_s = \Sigma q_s p_u / \Sigma q_u p_u$. On the condition of the equality of the values of the price and physical index, which are weighted according to the indicators of the pattern of the USSR and the United States, the function of the national value amounts becomes both a single-valued and an invertible function. In practice this means that the level of USSR economic development can be compared in terms of the United States with any capitalist country and, in turn, the state of the economy of each of the capitalist countries can be compared in terms of the USSR with other socialist countries.

7807
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INCENTIVES TO PROMOTE TECHNICAL PROGRESS DISCUSSED

Moscow PLANOVOYE KHOZYAYSTVO in Russian No 11, Nov 80 pp 51-58

/Article by Candidate of Economic Sciences B. Smirnov: "Development of the Forms of Material Stimulation of Technical Progress"/

/Text/ The practical experience of improving the mechanism of managing scientific and technical progress confirms that the most important key aspect of this problem is the creation for enterprises of the most favorable conditions for the output of new, advanced equipment as compared with previously assimilated and obsolete equipment. The successful solution of this problem requires primary orientation toward scientific and technical progress of all the components of the economic mechanism--planning, financing, pricing, material stimulation--as the successive links of the realization of the interests of society, the collectives of enterprises and individual workers.

Planning is the initial and main form of assurance of the unity of economic interests. The tasks of socialist society in the area of increasing the technical and economic level of production and products, of increasing their quality and the output volumes in conformity with public needs are embodied precisely in the plan. Therefore, planning also functions as the primary component of economic management, the main activity of enterprises and the sectors of the national economy, the most important directions and the results of which take the form of a unified system of plan indicators.

An essential component of economic management is the material stimulation of the development of scientific and technical progress. Inadequate effectiveness of the incentive mechanism can have the result that the entire set of economic levers of scientific and technical progress will not yield the desired results. In much the same way as the unified system of plan indicators of industrial enterprises the system of their material stimulation should also be a unified system, which focuses the interests of the workers on the solution of the problems of intensifying production by the extensive use of the achievements of science and technology.

About 20 different and inadequately interconnected incentive systems have been in effect for a long time at industrial enterprises. Among them are a general cost accounting system for the results of current economic activity on the output of assimilated items and a special cost accounting system for the development and introduction of new equipment. The lack of the proper unity among them leads to certain

conflicts in the economic interests of enterprises with regard to the choice of the direction of work and gives rise to the alternative of the output of the assimilated or a new product, the increase of the organizational and technical level of production or the maintenance of the achieved level.

Since the development and introduction of new equipment often are backed by means of stimulation to a considerably less extent than current production, this choice in many instances is made not in favor of scientific and technical progress. A larger and larger number of specialists in the field of the management of scientific and technical progress see a way out of this situation not in seeking an increase of the special incentive funds for new equipment, but in enhancing in its stimulation the role of cost accounting incentive funds. This, in our opinion, correct position in turn requires the solution of the question of the interrelationship of the special and cost accounting stimulation of enterprises, of the basic combination in the unified system of the functions of stimulation for new equipment and for the current results of production operations.

The problem of creating a unified cost accounting system of material incentives, which along with the current operation of enterprises would also cover their activity on expediting scientific and technical progress, became a topic of discussion among Soviet economists after the beginning of the economic reform. "The improvement of the existing bonus system," I. Oblomskaya wrote, "...should proceed not along the lines of the further development of an independent system of stimulation of the production of new equipment, but in the direction of the development of a unified mechanism of the stimulation of both the current reproduction process and scientific and technical progress which is intended for the future."[1] G. Yegiazaryan and L. Kheyfets noted that "under the conditions of the economic reform the retention of two systems, which differ according to the sources of the formation of the funds, is inadvisable. It is necessary to couple the two systems, having ensured an interest in technical progress through the main system."[2] "The fact that the economic criterion of new equipment and of all social production is a uniform criterion," L. Gatovskiy emphasized, "predetermines the need for the convergence and gradual unification of the two systems of stimulation."[3]

At the same time the idea of creating a unified cost accounting system of material stimulation has not yet received adequately complete, thorough economic substantiation and approval. As a result it has to a considerable extent the nature of a hypothesis about ways to develop the material stimulation of production.

The long-term and to a certain extent separate functioning of the general and special incentive systems up to now resulted from the peculiarities of the development of the national economy in our country. At the initial stage of the building of socialism and during the period of industrialization there was no separate system of the stimulation of scientific and technical progress, since the entire economic mechanism, which at the same time also covered the solution of current national economic problems, was aimed at it. The need noted by V. I. Lenin "to link the scientific plan of electrification with current practical plans..."[4] and to provide for the payment of bonuses to specialists, first of all "for the especially successful and quick fulfillment of the most important of the organizing and technical assignments..."[5] was reflected, in particular, in this.

The thesis of V. I. Lenin that socialism is inconceivable without equipment built according to the latest word in science was the basis for the management of the national economy during those years. And it is quite natural that the stimulation of workers for new equipment was one of the first forms of material stimulation in Soviet industry.

Later, as the scale of production and the number of enterprises, organizations and construction projects increased, the production relations between them became more complex and production and personal needs increased, the reorientation of the economic mechanism and the increase in it of the functions of management of the so-called current production gradually took place. Its goal consisted primarily in increasing the volumes of the output being produced. Planning and material stimulation were subordinated to a greater and greater extent to the achievement of this goal. The acceleration of scientific and technical progress is made into a special function of production management, for the realization of which special economic means were also required.

The solution of the problems of restoring the national economy of the country during the postwar period enhanced the role in the mechanism of management of the elements which "work" for an increase of the volume indicators of production. As a result the separation and parallel development of the forms of material stimulation of current production activity and scientific and technical progress emerged.

Prior to the economic reform (1965) the proportion of special incentive funds for new equipment in the total amount of assets of enterprises for the payment of bonuses was significant: in 1958 16 percent, in 1965 33 percent. With the formation in industry of cost accounting economic stimulation funds it decreased substantially and for 1970-1978 was on the average less than 4 percent of the amount of assets for material incentives. This complicated the problem of creating effective stimuli of scientific and technical progress and required the entire system of material stimulation to be put in good order and not just the special incentive system, which had a number of fundamental shortcomings. The latter resulted, in our opinion, not so much from the imperfections of the scales of the determination of the amount of incentive funds, the distribution of bonuses by stages of the work among the workers and so forth, as from the economic restrictions which this system placed on the material interest of the collectives of enterprises in expediting scientific and technical progress.

The indicated restrictions consist in the fact that the special incentive system in essence is exclusive for individual, local groups of workers who are engaged in the development and production of new equipment, provides for the payment of bonuses for individual, one-time operations on new equipment, has negligible assets as compared with the cost accounting material incentive funds and operates in fact in separation from them.

However, scientific and technical progress can no longer be an object of the activity of only individual groups of workers who are engaged directly in scientific research and the development of new equipment. "The involvement in this historically important process of all the participants in social production, all the links of the economic mechanism is assuming a greater and greater role," it was noted at the 25th CPSU Congress.[6]

Scientific and technical progress also does not reduce to the sum of the individual measures, no matter how significant and effective they might be. It is to a greater and greater extent the steadily expanding and intensifying process of the continuous improvement of production. For example, in 1970-1978 alone the number of measures on new equipment, which were adopted annually, increased 1.6-fold in industry.

The steady increase of the extent of the measures on the acceleration of technical progress which are implemented at enterprises is complicating within the special incentive system the organization of the effective payment of bonuses to workers, since special and complicated accounting of their labor contribution is required for this. Thus, in the automotive industry more than 170 different operations on new equipment are implemented annually on the average per enterprise, in heavy machine building about 160 are.

The proper distribution of the bonus for the implementation of each measure is an extremely complicated and labor-consuming process. Precisely for this reason, as practical experience shows, it is frequently of an equalizing and impersonal nature. Such a situation attests to the need for the substantial reorganization of the system of stimulation of technical progress with the use of the principles which have become firmly established within the cost accounting incentive mechanism.

As is known, a number of measures on increasing the interest of enterprises and organizations in expediting scientific and technical progress are being implemented in industry. During the Ninth and 10th Five-Year Plans the proportion of output of the highest quality category in the total sales volume and the growth rate of labor productivity were included among the indicators of planning and the formation of cost accounting material incentive funds.

The former indicator characterizes the activity of enterprises on increasing the production volumes of products, which conform to or exceed with respect to their technical and economic parameters the best foreign and domestic achievements of science and technology. Being an object of planning and stimulation, it expresses in concrete form the relations between society and the collectives of enterprises with respect to scientific and technical progress in the area of the products being produced. The indicator of the growth of labor productivity as an object of the system of management conveys to a considerable extent the economic relations in the sphere of the increase of the technical and economic level of the production process itself.

In conformity with the decree of the CPSU Central Committee and the USSR Council of Ministers "On Improving Planning and Strengthening the Influence of the Economic Mechanism on Increasing Production Efficiency and Work Quality" the role of these indicators in the system of cost accounting stimulation is increasing even more, for they are becoming the main fund-forming indicators of enterprises, while during the Ninth and 10th Five-Year Plans they were only fund-adjusting indicators. As a result the two main directions of technical progress are becoming immediate objects of cost accounting stimulation, which attests to a quite definite tendency for the role of material incentive funds in the management of the development and introduction of new equipment to increase.

At the same time for a number of years a new special system of the management of scientific and technical progress was experimented on in the Ministry of the

Electrical Equipment Industry, the Ministry of Heavy and Transport Machine Building and other ministries. The mechanism of the material stimulation of new equipment was also changed substantially in it. These changes provide for the use of the profit of enterprises as a source of the formation of special bonus funds and the establishment of their direct connection with the actual impact of the new equipment, the creation at scientific research institutes and design bureaus of cost accounting stimulation funds, which to a significant extent are formed from the profit of industry, as well as the broadening of the rights of enterprises and organizations in the use of the assets for paying bonuses for new equipment.

An important feature of this mechanism of stimulation was its definite connection with the general system of planning and economic stimulation. Thus, the amount of the reduction of the production cost due to the introduction of new equipment is taken into account when planning the profit of enterprises. The stimulating role of price markups within the general incentive system consists in the fact that they are taken into account not by the plan indicators, but by the actual indicators on the sale of products, the profit and the profitability. Here the markups received are evaluated separately and are excluded from the base of planning for the following year.

As a whole the new system of the planning and stimulation of scientific and technical progress has justified itself. In conformity with the degree of the party and the government on the improvement of the economic mechanism it is being extended to other sectors of industry.

All this makes it possible to reach a conclusion about the occurring process of the extension and broadening of cost accounting principles in the formation and use of the special assets for paying bonuses for new equipment, as well as about the greater and greater interpenetration of the principles of the effect of the special system and the cost accounting material incentive funds.

The problem of creating a unified mechanism of stimulation is becoming especially pressing under the conditions of new organizational forms, in which the scientific, technical and economic development of modern production is being carried out to a greater and greater extent. The organization of scientific production and production associations, which contain scientific research institutes, design bureaus and enterprises, requires the establishment of unity in the material stimulation of their workers. The decree of the party and the government on the improvement of the economic mechanism is affording new opportunities for ensuring the unity of the stimuli of labor.

The changeover to the compilation of long-range plans of economic and social development on the basis of the comprehensive program of scientific and technical progress makes it possible to foresee the influence of the process of developing and introducing new equipment on the main indicators of enterprises and the sectors of industry and thereby to eliminate the decrease of their economic stimulation funds. The procedure of taking into account the value of the operations of an industrial nature on new equipment, which are carried out at the expense of the unified fund for the development of science and technology, in the total production volume with the addition of the standard profit is conducive to this.

The improvement of the financial methods of expediting scientific and technical progress, which is called for by the decree, is also aimed at the convergence of the financing of sectorial science and technology with the principles of cost accounting. The role of cost accounting fund-forming indicators in expediting scientific and technical progress is increasing as a result of the increase of the effectiveness of the price markups and reductions on new equipment.

Thus, at present a number of objective conditions of the creation of a unified system of material stimulation, which would direct the workers of enterprises and associations toward the acceleration of scientific and technical progress, are forming.

An important step in the solution of this problem has been taken at a number of enterprises and associations of the Ministry of the Electrical Equipment Industry, at which unified material incentive funds have been created in accordance with the decision of the Interdepartmental Commission attached to USSR Gosplan. The immediate goal of the experiment is the increase of the efficiency of the use of the incentive funds of enterprises (associations) first of all for stimulating scientific and technical progress. For this all the assets received by the enterprises (associations) in accordance with the prevailing bonus system, except the bonus for the All-Union Socialist Competition, are channeled into the unified fund. The possibility of redistributing the assets being received with an orientation toward increasing the bonus for new equipment is envisaged in the process of using it.

The analysis of the results of the experiment in this area of it attests to the effectiveness of the chosen means of stepping up the stimulation of technical progress. The creation of unified material incentive funds at such associations as Uralelektrotyazhmash and Zaporozhtransformator made it possible to increase substantially the total amount of incentive funds for new equipment and to improve the ratio between them and the economic impact of the measures on the technical improvement of production.

During the experiment on the creation of a unified stimulation system the payment of bonuses to the collectives of the scientific research institutions belonging to the associations from the assets of the unified material incentive funds for the fulfillment of the indicators of the activity of the association as a whole was established for the purpose of ensuring the more complete unity of the economic interests of the workers of science and production.[7] Thereby the differences in the indicators and the amounts of the material incentives to the workers of the enterprises and the scientific research organizations were overcome to a considerable extent, and the structure of the sources of the incentive funds of scientific research institutes also changed substantially due to the increase of the proportion of the assets received from the profit of the enterprises.

At present these assets hold a decisive place (60-70 percent) in the stimulation funds of the scientific research institutes of the associations (enterprises) which are taking part in the experiment. As a result the proportion of the bonuses in the average wage of the workers of scientific research institutes increased in the Uralelektrotyazhmash Association from 7 to 15 percent and in the Zaporozhtransformator Association from 10-12 to 20-22 percent, which promoted an increase of the material interest of scientists in the end results of the work of the associations.

The inclusion of all the bonuses and awards paid from the unified material incentive funds in the average wage was an important feature of the experiment. This made it possible in an economically sounder way to plan and evaluate the ratio between its growth and the growth of labor productivity and to increase the interest of the workers of the associations (enterprises) in the efficient use of incentive funds.

Thus, the experiment on creating unified material incentive funds made a definite contribution to the development of the forms of material stimulation and to the increase of the efficiency of the use of the aggregate incentive funds of the enterprises (associations) for expediting scientific and technical progress.

At the same time some shortcomings of the experiment were also detected. For example, the indicators, standards and sources of formation of the unified material incentive funds remained unchanged. Uniform, universal indicators of the formation of incentive funds, which would have reflected most completely all the main aspects of the activity of the enterprises (associations), and first of all the results of their work on the output of new equipment, were not used during the experiment. Thereby a changeover from individual, diverse types of activity and the forms of their stimulation to the overall results of the work of the enterprises and to a unified systems of the formation of material incentive funds was not accomplished. Only the mechanical merging of the various incentive funds in a unified fund took place. At a number of enterprises the indicators of the payment of bonuses to workers of the intraplant subdivisions in essence also did not change. As a result as before the process of paying bonuses to the workers is complicated and elements of duplication in stimulation are being retained.

The prevailing procedure of forming and using material incentive funds with certain changes can serve, in our opinion, as the basis of the creation of a unified mechanism of stimulation. Under the present conditions of management it is expedient to enhance the role of the economic indicators of technical progress in the mechanism of forming the material incentive funds, for which it is not mandatory along with the prevailing indicators to introduce in the system of fund formation new indicators which reflect technical progress. This would be in essence a "mechanical" act and would leave unsolved the problem of ensuring the unity of the stimuli of new equipment and current production.

The creation of a unified system of planning and stimulation presumes the fundamental combination of the indicators of technical progress and the current process of reproduction, which in turn is impossible without a certain modification of them. The problem, it seems to us, consists in "directing" the prevailing cost accounting indicators of the formation of material incentive funds toward technical progress. For this purpose it would be possible to approve a procedure of forming incentive funds subject directly to the indicators of the volume of output according to the categories of its technical level and quality, by introducing differentiated standards of deductions for the incentive funds of enterprises for each percent increase of the output of products of the highest and first quality category. The increase of the output of products, which results from the output of items of the second quality category, should not be taken into acount when forming the funds.

Moreover, it would be advisable when forming the material incentive funds to take into account not the entire increase of labor productivity achieved at the enterprises, but only that portion of it which was obtained due to the increase of the

organizational and technical level of production. Such a measure would eliminate the influence on the increase of labor productivity of factors not dependent on the enterprises (for example, structural changes in the output, the materials and so forth) and would orient the workers to a greater extent toward intensive factors of the increase of production.[8]

This suggestion has already been made in economic literature, but its practical implementation is being checked by the inadequately extensive use at enterprises of the factor planning and analysis of labor productivity.

The introduction for enterprises of higher standards of deductions for the incentive funds for the increase of the profit (profitability), which was achieved due to the output of new products with a price markup and the reduction of the production cost of items as a result of the introduction of new equipment and technology, would be justified, in our opinion, for enhancing the role of the indicator of the profit (profitability) in the system of the cost accounting stimulation of scientific and technical progress. This additional profit, which constitutes the cost accounting impact of scientific and technical progress at the enterprises, should also be established for them as the indicator of the economic impact from the implementation of scientific and technical measures, as is called for by the above-indicated decree of the CPSU Central Committee and the USSR Council of Ministers.

In order to increase the cost accounting stimuli of the drafting of stepped-up plans in the area of technical progress it seems expedient to increase (decrease) the amounts of the incentive funds in the five-year plans for those enterprises, whose indicators of the output of products of the highest category, as well as the growth of labor productivity and the profit (profitability), which were achieved due to the use of new equipment, during the five-year plan are greater (less) than the corresponding average sectorial (average group) indicators. This would make it possible to combine in the cost accounting incentive system the payment of bonuses to workers for the level and increase of the indicators of technical progress in the five-year plans and for the exceeding of them by years of the five-year plan.

For the purpose of enhancing the role of cost accounting stimuli of the introduction of new equipment it would be important to expand the use of the indicators of technical progress in the process of using incentive funds. For this, in our opinion, it is sound practice to establish as the main indicators of the material stimulation of the workers of the design, technological and other technical services of enterprises, which deal with new equipment, such indicators, for example, as the fulfillment of the plan of the division (laboratory) on the increase of the technical and economic level and quality of products, on the elaboration of measures on the growth of labor productivity and the reduction of the production cost of items due to the increase of the organizational and technical level of production.

For the workers of the main shops of the enterprises, apparently, it is possible to use such indicators as the fulfillment of the shop plan on intraplant deliveries with allowance made for the technical level and quality of products, on the increase of labor productivity and the reduction of the production cost of items due to the introduction of new equipment. When improving the intraplant stimulation of the workers of enterprises for new equipment from the material incentive funds the experience of the Sumy Machine Building Production Association imeni M. V. Frunze,

which has been gained in this matter and has been covered in the press, should be utilized more extensively.

The favorable experience of using the assets of unified material incentive funds for stimulating the activity of the workers of scientific research organizations makes it possible to conclude that the functions of ensuring a link between the economic interests of the workers of science and production can be effectively performed by the unified cost accounting system of material stimulation. This can be accomplished by the changeover to the direct deductions of assets for the stimulation of the workers of scientific research institutes and design bureaus from the profit of enterprises, which is intended for the formation of their incentive funds.

The systematic enhancement of the role of cost accounting incentive funds in the management of scientific and technical progress and the fundamental connection to them of the mechanism "the impact of new equipment--the price markup--the additional profit--the bonus," which is being developed within the framework of special stimulation, will make it possible to create a unified system of material stimulation and to ensure the effective interest of the workers of industry in the increase of production efficiency on the basis of new equipment.

FOOTNOTES

1. PLANOVOYE KHOZYAYSTVO, No 10, 1969, p 64.
2. "Problemy material'nogo stimulirovaniya v promyshlennosti" /Problems of Material Stimulation in Industry/, Moscow, "Ekonomika", 1970, p 23.
3. L. M. Gatovskiy, "Ekonomicheskiye problemy nauchno-tekhnicheskogo progressa" /Economic Problems of Scientific and Technical Progress/, Moscow, "Nauka", 1971, p 343.
4. V. I. Lenin, "Poln. sobr. soch." /Complete Works/, Vol 42, p 344.
5. V. I. Lenin, "Poln. sobr. soch.," Vol 36, p 180.
6. "Materialy XXV s"yezda KPSS" /Materials of the 25th CPSU Congress/, Moscow, Politizdat, 1978, p 48.
7. The material stimulation of the workers of the scientific research institutes of Zaporozhtransformator from the unified material incentive funds was made dependent on the fulfillment by the association of the plans on the output of products of the highest quality category and labor productivity, which reflect technical progress at the association. This seems more valid.
8. According to the data of the USSR Central Statistical Administration, the introduction of new equipment and the implementation of measures on the scientific organization of labor in 1971-1978 provided only 60 percent of the total increase of labor productivity in industry.

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